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NEW COMPLETE GEOGRAPHY

TARR & McMURRY

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8

NEW COMPLETE GEOGRAPHY

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TORONTO

NEW COMPLETE GEOGRAPHY

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*WITH MANY COLORED MAPS AND NUMEROUS ILLUSTRATIONS
CHIEFLY PHOTOGRAPHS OF ACTUAL SCENES*

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PREFACE

Assumptions in the Preparation of this Volume. — The New Complete Geography is a complete geography. It assumes, on the part of children, the possession of a number of general concepts suitable to serve as a basis for the more intensive study of geographic details. These general concepts include the most important superficial phenomena, such as mountains, rivers, lakes, plains, plants, and animals, and the relations of all these to one another and to man.

The Place of General Geography. — The first matter to be decided before beginning to write a complete geography is that of the order of topics. Geography treats of so many heterogeneous subjects that it is difficult, on either psychological or scientific grounds, to say which should be discussed first. But it is customary in school geographies to place the broadest and most difficult part first, that which is commonly known as General Geography, treating of such topics as the motions of the earth, its place among the heavenly bodies, latitude and longitude, ocean currents, winds, rainfall, and meteorological conditions generally. This arrangement requires the young student, — and he is very young at the beginning of the sixth grade, — who has studied only the most manifest and simple phenomena of geography, to plunge at once into discussions that are difficult even for scientists.

The authors of this geography regard such an arrangement, although sanctioned by usage, as unwise, and they have postponed the study of these broad and more or less abstract discussions for at least a year in the life of the student. Instead, they begin at once with our own continent and country.

There are two brief chapters treating of general, but manifest, facts. The first contains a simple record of the history of North America, showing the most plainly visible effects of geologic change. The second treats of the plants, animals, and peoples of the continent. This is all simply and easily comprehended by the sixth-grade child. There are but fourteen pages, in all, of these two chapters. Following these the student enters upon a careful and intensive study of the United States, by sections and states. This is an illustrated presentation of the geography of our own country, including all the topics that can be said to belong to elementary geography, — the states and their surface features, government, peoples, occupations, and even such historic facts as have largely affected geography or have been affected by it. This study includes the Dependencies of the United States, and is followed by a similar study of our North American neighbors. It furnishes work for at least a year. It is only after this has been completed that the body of geographic data known as General Geography is offered. By that time the students are better prepared to undertake this difficult work.

Comparisons, Reviews, and Correlations. — The authors are firm believers in the value of review, and particularly in the value of review by comparison, showing how the conditions prevailing in one part of the world are found also in many others, and that the same causes produce similar effects, wherever occurring. Through these frequent reviews and comparisons not only do the students keep fresh the knowledge already acquired, but they constantly use it to explain similar phenomena elsewhere. For example, the most important human industries are found among practically all civilized nations. These are similarly affected by conditions, climatic, physiographic, and social. The child who has learned about the cotton mills of New England finds it much easier to understand the conditions of cotton manufacture in England and in other countries. The study of the production of wheat on the northwestern plains makes it easy to comprehend the physical conditions under which grain is grown in Russia. The effects of climate and of soil, of mountain and of river, can almost be assumed in advance of knowledge. This all means that, if our own country is studied in the right way, if children have learned the prevailing conditions and the relations of cause and effect, it is easy for them to extend their knowledge to other lands where similar conditions are found. This doctrine has guided the authors of this book throughout their work.

At the beginning of the study of the surface conditions of South America, page 217, or of Europe, page 238, etc., they have reproduced at considerable length similar conditions in our own country, which the students already know about; and, continually, throughout the latter part of the book, they have introduced brief comparisons with the United States to explain the conditions found.

These are simply typical illustrations of the uses made of comparison to give a sense of reality to the children studying geography, and to utilize the material already gathered. In addition to the comparisons given in the body of the text, there are review questions to draw out from the children still further resemblances and differences.

In addition to all this, the final section of the book is devoted exclusively to a review of the United States, comparing it with other countries. This section includes such features as area and population, animals, food products, textile products, mineral products, and commerce.

There is another motive for this final section, Part VI. It seems to the authors a much more fitting and useful conclusion to the book than that which is found in the usual last chapter, "The Islands of the Pacific." There is a sort of absurdity in ending our journey about the world in the remotest and most unimportant part of it, and so in this final chapter the authors of this book bring the students back home, there to reconsider the most valuable truths that they have learned in the course of their journey, to compare them with one another, and to draw, finally, general conclusions, of permanent worth.

Geographic Causes and Effects. — The authors believe that much of the human element of geography is to be traced to a physiographic basis, that the conditions of stream and forest, of mountain and river, of climate and soil, are at the foundation of many of the institutions of civilization, or at least determine their location to a very large extent.

The location of cities, for instance, is not dependent upon chance, but in most cases rests upon some manifest natural cause, — the presence of a harbor or of a navigable stream, the natural crossing of lines of transportation, the presence of some gift of nature, as a bed of ore or a waterfall, or the need of a center of trade for a farming section.

Trade routes, too, are usually due to natural conditions. The railroad must follow, at least at first, the lines of already established traffic, — the river bed, the canal, or the stage route, and these, in their day, were determined by the lines of least resistance.

So, also, great industries are located

where there are the best facilities for them, including power, transportation, and labor. It is no accident that for many years cotton, grown in the Southern States, was manufactured in the Northern States, or in England. So, throughout this book, conditions are traced back to their geographic causes, and the record of these conditions becomes not merely a collection of isolated facts, but a continued tale, having some of the interest of history as well.

Comprehensiveness of Treatment. — A textbook for young pupils should be readable. To give the bare bones of a subject, though they may be good bones, is not an adequate treatment. Perhaps the chief criticism of the old-style textbooks upon scientific subjects, geography included, is that they are skeletons merely. They give the outlines of a subject, in the briefest and most general terms. Consequently, the young readers fail to get living pictures and real images of what they study. The differences between such a book and a good book is in the greater amount of detail offered in the latter, and the skill with which it is used. History and geography have been especial sufferers from the condensed textbook. The authors of the New Complete Geography believe that each important phase of the subject should be enriched by an abundance of detail, shedding light on all parts. The child, having been put in possession of all this matter, can draw his own conclusions, because he has genuine images. He sees the world, as the geographer would have him see it, with vividness.

The Establishment of Types. — The authors of the New Complete Geography place little reliance upon definitions. These are given merely to aid the memory. The chief reliance is placed upon the establishment in the minds of children of *types* of geographic features and phenomena. Each industry, for instance, is treated fully, once, in the place where it is most conspicuous and important. Thus lumbering, fishing, and certain manufactures, as of boots, shoes, and textiles, the mining of coal and iron, and the manufacture of goods requiring these, are discussed at length while studying the Northeastern States. Gold mining is treated in connection with the states of the far west and southwest; irrigation and grazing, with the great plains states; and agriculture and the manufacturing that depends upon agriculture in the Central and Southern States. By thus treating each important industry once, and very fully, in its most suitable locality, types are established which explain conditions in other localities, and avoid the necessity of that tiresome repetition which has rendered geography forever distasteful to so many students. As has been pointed out already, in so far as possible, the types are drawn from the United States, where many of them can be inspected by the students, and where all of them can be so explained as to make them easily comprehensible. For instance, cotton is treated fully on pages 56–57; irrigation, on pages 117–121, and the raising of cattle, on pages 90–91. Consequently, when irrigation, or cotton growing, or cattle raising is mentioned in the study of any other part of the world, it is at once understood.

Other special features of geography that have no sufficient illustration in the United States are treated fully where they occur, as, for example, Tropical Forests in Brazil, page 225; the Linen Industry in Great Britain, page 253; the Silk Industry in France, page 268. These types once established, like those developed in studying the United States, are for use, not only throughout the book, but throughout life.

Maps and Illustrations. — The maps used in this book are in the main reproductions of the now famous maps used in other editions of the Tarr and McMurry Geographies, but there are numerous illustrations, gathered from other sources, especially adapted to the needs of these books. The greatest care has been taken to make both maps and illustrations the best possible for educational purposes.

Acknowledgments. — The authors are indebted to Mr. Phillip Emerson of the Cobbett School, Lynn, Mass., and to Professor R. H. Whitbeck of the University of Wisconsin, for assistance in the preparation of the original volume as acknowledged in its preface, and Professor Whitbeck has given further aid in the later revisions, especially in the selection of illustrations.

For illustrations, the authors are much indebted to Mr. O. W. Furlong, the well-known artist, who made many of the drawings, and to Mr. William Rau of Philadelphia, from whose extensive collection of photographs they selected a large part of the photographs from which the half tones were made. They are indebted also to other photographers whose pictures have been used — a list far too large to incorporate here. Special mention should be made of the assistance rendered by the Philadelphia Commercial Museum in supplying a series of world product maps, and in giving permission to reproduce some of their photographs.

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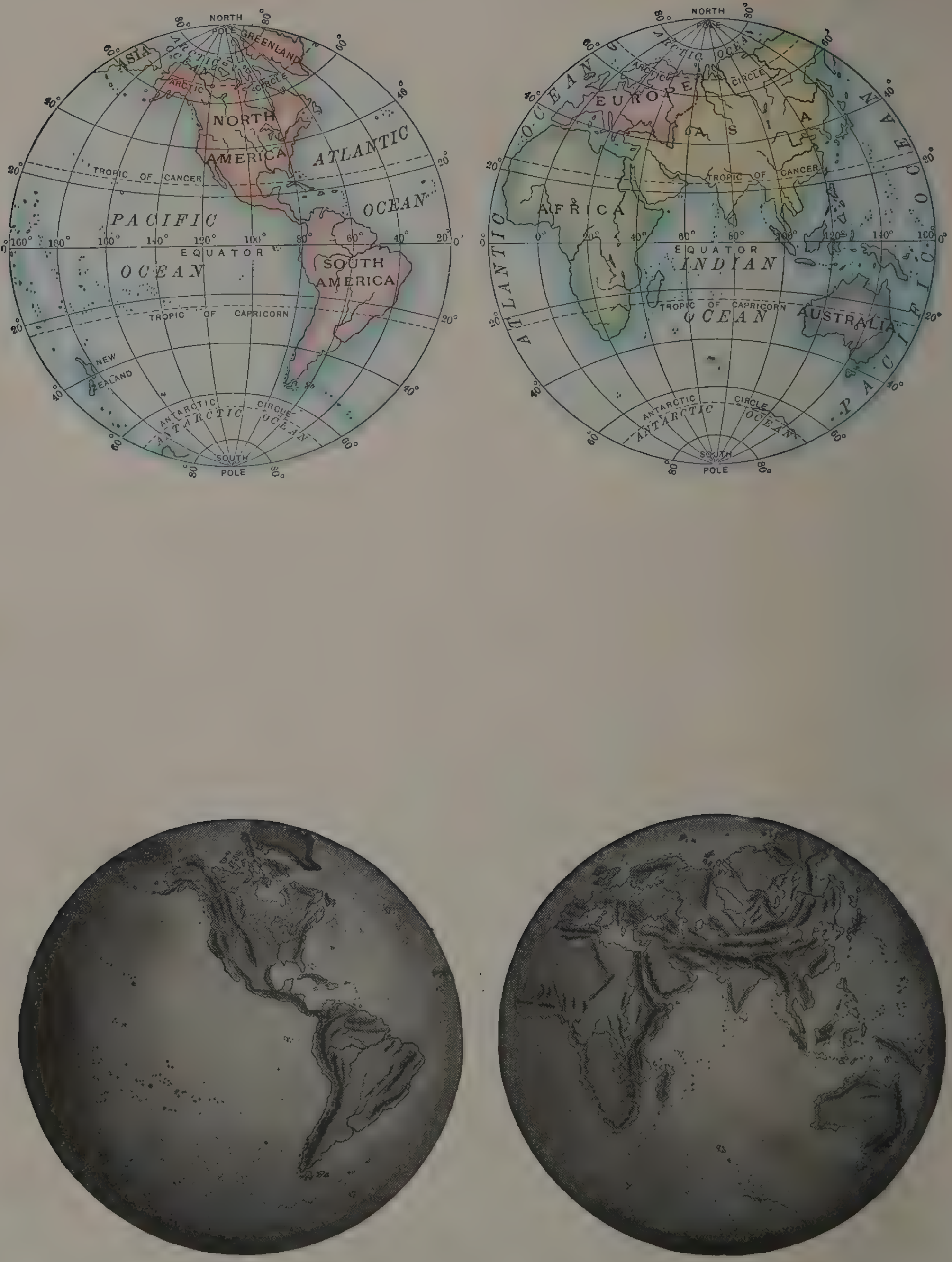

FIG. 1.
The Eastern and Western Hemispheres.

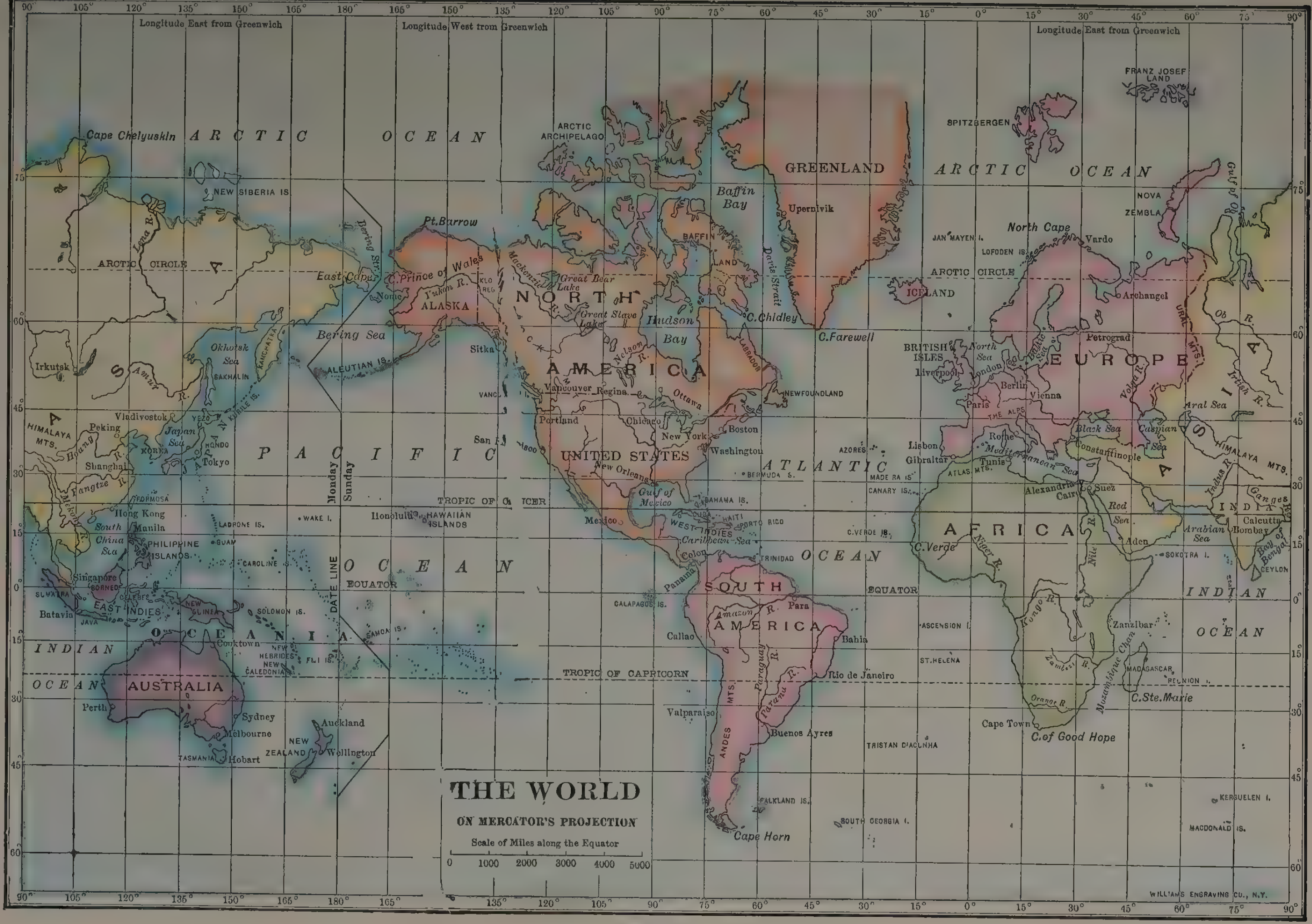
THE WORLD
ON MERCATOR'S PROJECTION
Scale of Miles along the Equator
0 1000 2000 3000 4000 5000
Longitude East from Greenwich
Longitude West from Greenwich
ARCTIC OCEAN
PACIFIC OCEAN
ATLANTIC OCEAN
INDIAN OCEAN
NORTH AMERICA
SOUTH AMERICA
EUROPE
ASIA
AFRICA
AUSTRALIA
OCEANIA
GREENLAND
UNITED STATES
ALASKA
ICELAND
BRITISH ISLES
EAST INDIES
WEST INDIES
PHILIPPINE ISLANDS
HAWAIIAN ISLANDS
NEW ZEALAND
ARCTIC CIRCLE
TROPIC OF CANCER
EQUATOR
TROPIC OF CAPRICORN
DATE LINE
Monday
Sunday
Bering Str.
Bering Sea
Hudson Bay
Baffin Bay
Davis Strait
Gulf of Mexico
Caribbean Sea
Mediterranean Sea
Black Sea
Caspian Sea
Aral Sea
Red Sea
Arabian Sea
Bay of Bengal
North Sea
Baltic Sea
Okhotsk Sea
Japan Sea
South China Sea
Cape Chelyuskin
Pt.Barrow
C.Prince of Wales
East Cape
C.Farewell
C.Chidley
North Cape
C.Verde
C.of Good Hope
C.Ste.Marie
Cape Horn
SPITZBERGEN
FRANZ JOSEF LAND
NOVA ZEMBLA
NEW SIBERIA IS.
ARCTIC ARCHIPELAGO
JAN MAYEN I.
LOFODEN IS.
BAFFIN LAND
LABRADOR
NEWFOUNDLAND
ALEUTIAN IS.
KAMCHATKA
SAKHALIN
KURILE IS.
YEZO
HONDO
KOREA
FORMOSA
LADRONE IS.
GUAM
WAKE I.
CAROLINE IS.
SOLOMON IS.
NEW GUINEA
NEW HEBRIDES
NEW CALEDONIA
FIJI IS.
SAMOA IS.
SUMATRA
BORNEO
CELEBES
JAVA
TASMANIA
AZORES
MADEIRA IS.
CANARY IS.
C.VERDE IS.
BERMUDA S.
BAHAMA IS.
CUBA
HAITI
PORTO RICO
TRINIDAD
GALAPAGOS IS.
ASCENSION I.
ST.HELENA
TRISTAN D'ACUNHA
FALKLAND IS.
SOUTH GEORGIA I.
KERGUELEN I.
MACDONALD IS.
MADAGASCAR
REUNION
SOKOTRA I.
CEYLON
HIMALAYA MTS.
URAL MTS.
THE ALPS
ATLAS MTS.
ANDES MTS.
Lena R.
Amur R.
Hoang R.
Yangtze R.
Mekong R.
Yukon R.
Mackenzie R.
Nelson R.
Great Bear Lake
Great Slave Lake
Amazon R.
Paraguay R.
Parana R.
Niger R.
Kongo R.
Nile R.
Zambezi R.
Orange R.
Volga R.
Ob R.
Irtish R.
Indus R.
Ganges R.
Gulf of Ob
Mozambique Chan.
Irkutsk
Vladivostok
Peking
Shanghai
Hong Kong
Manila
Tokyo
Singapore
Batavia
Cooktown
Perth
Sydney
Melbourne
Hobart
Auckland
Wellington
Nome
Sitka
Vancouver
Regina
Portland
San F.
Chicago
Ottawa
New York
Boston
Washington
New Orleans
Mexico
Colon
Panama
Honolulu
Callao
Valparaiso
Buenos Ayres
Rio de Janeiro
Bahia
Para
Upernivik
Liverpool
London
Paris
Berlin
Vienna
Rome
Lisbon
Gibraltar
Tunis
Petrograd
Archangel
Vardo
Constantinople
Alexandria
Cairo
Suez
Aden
Bombay
Calcutta
Zanzibar
Cape Town
WILLIAMS ENGRAVING CO., N.Y.

FIG. 2.

PART I. NORTH AMERICA

I. The Story of Our Continent

Size and shape of North America

North America is third in size among the six continents. The two that are larger are Asia and Africa. (See Appendix, pp. 390–391.) North America has the form of a triangle, very broad in the north and narrow in the south. Draw the triangle. Compare its shape with that of South America (Fig. 1). Of Africa (Fig. 1).

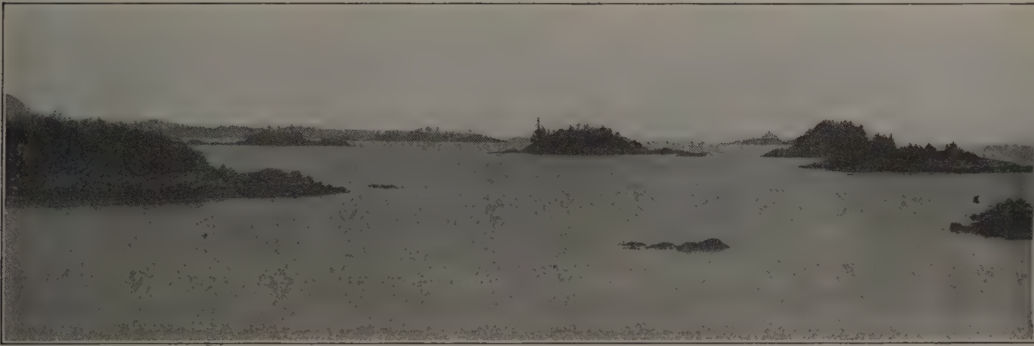

Fig. 3. — A view in the harbor of Sitka, Alaska. Here the land has been lowered, and only the tops of the hills rise above the water, forming many islands.

Extent of changes in the past

It seems to us that the continent must always have looked as it does now. But that is not the case. Every mountain, hill, and valley upon it; every river and lake; every acre of soil, has been slowly formed. Indeed, there was a time when the continent itself was not here; it, too, has been made. Forces have been at work, for countless ages, changing matter over and over, and causing it ever to take new forms. The story of these changes is a very long one, and only a small part of it can be told here.

How the continent began

It is thought that the earth was once a great ball of gases, white hot like the sun, but that it cooled so as to form a crust of solid rock on the outside. As the inside cooled further it shrank; this caused the crust to settle in some places and to rise in others, forming wrinkles, just as the skin of an apple wrinkles when the fruit dries. Later, water gathered in the hollows, making oceans and lakes, while the higher parts of the wrinkles became dry land.

The making of our principal mountains

At one time the central part of the continent was a vast sea, with only islands around its edges. Then these were lifted higher by the further wrinkling of the earth's crust, until large masses of land appeared in sight. No doubt the wrinkles changed from time to time in shape and position. But ridges were formed east and west of this sea, which rose higher and higher until they became mountains. In this way the Appalachian Mountains were

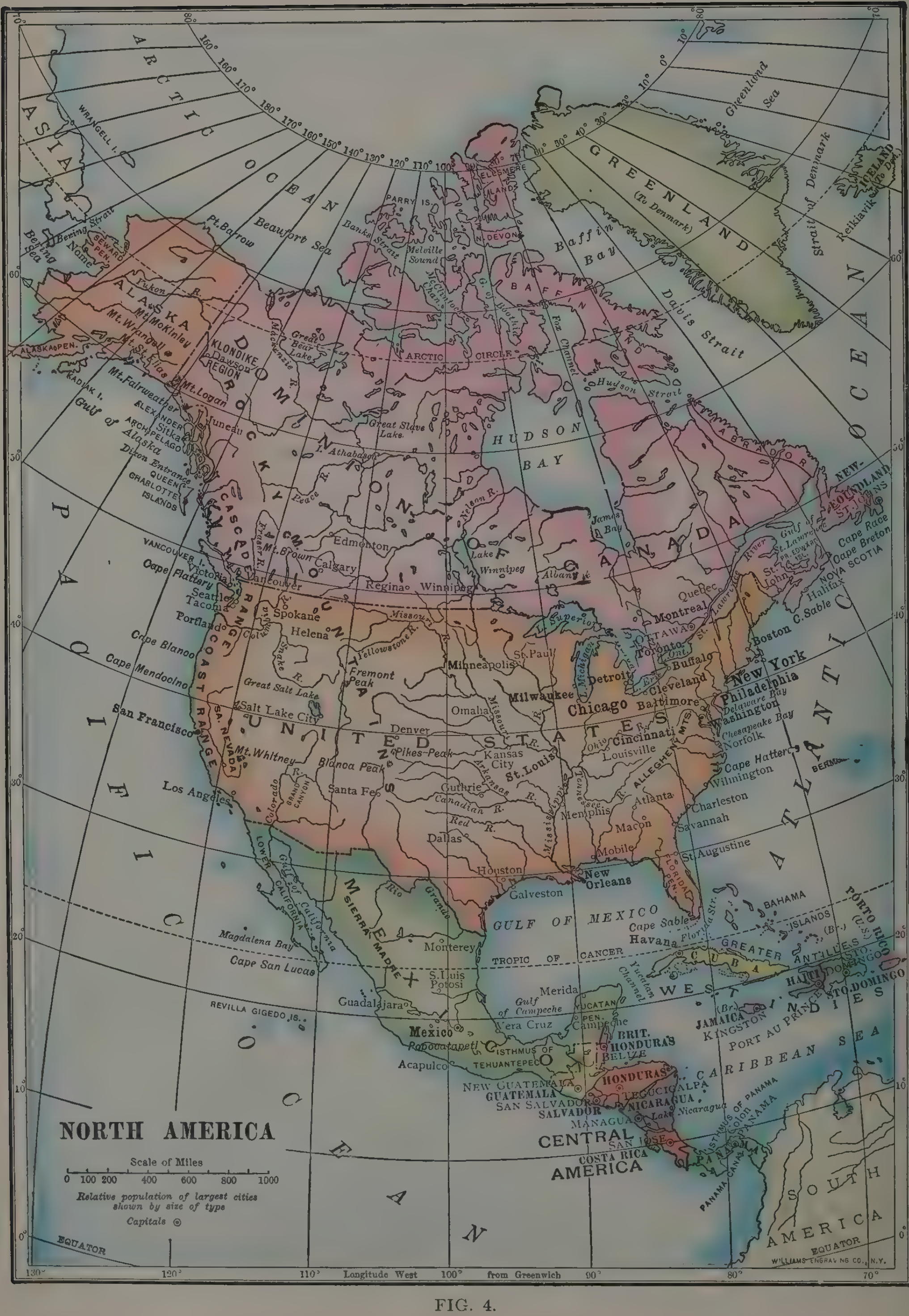
NORTH AMERICA
Scale of Miles
0 100 200 400 600 800 1000
Relative population of largest cities shown by size of type
Capitals ⊙
ARCTIC OCEAN
PACIFIC OCEAN
ATLANTIC OCEAN
ASIA
GREENLAND (To Denmark)
ICELAND (To Den.)
Reikiavik
Greenland Sea
Strait of Denmark
Baffin Bay
Davis Strait
Beaufort Sea
Bering Strait
Bering Sea
Wrangell I.
Nome
Seward Pen.
Pt. Barrow
Yukon R.
ALASKA
Mt. McKinley
Mt. Wrangell
Mt. St. Elias
Mt. Logan
Mt. Fairweather
Alaska Pen.
Kadiak I.
Gulf of Alaska
Alexander Archipelago
Sitka
Juneau
Dixon Entrance
Queen Charlotte Islands
Klondike Region
Dawson
Mackenzie R.
Great Bear Lake
Great Slave Lake
L. Athabasca
Peace R.
Parry Is.
Banks Strait
Melville Sound
McClintock Chan.
Ellesmere Land
N. Devon
G. of Boothia
Fox Channel
Baffin Land
Hudson Strait
Arctic Circle
Hudson Bay
James Bay
Labrador
Newfoundland
St. Johns
Cape Race
Cape Breton
Nova Scotia
Halifax
Gulf of St. Lawrence
Pr. Edward Isl.
St. John
St. Lawrence River
Quebec
Montreal
Ottawa
Toronto
L. Ont.
Buffalo
L. Erie
L. Huron
L. Michigan
L. Superior
Dominion of Canada
Rocky Mts.
Cascade Mts.
Fraser R.
Mt. Brown
Edmonton
Calgary
Regina
Winnipeg
Lake Winnipeg
Nelson R.
Albany R.
Vancouver I.
Victoria
Vancouver
Cape Flattery
Seattle
Tacoma
Portland
Columbia R.
Spokane
Helena
Missouri R.
Yellowstone R.
Snake R.
Fremont Peak
Cape Blanco
Cape Mendocino
Coast Range
Great Salt Lake
Salt Lake City
San Francisco
Sa. Nevada
Mt. Whitney
Los Angeles
Colorado R.
Grand Canyon
Blanca Peak
Pikes Peak
Denver
Santa Fe
United States
Minneapolis
St. Paul
Milwaukee
Chicago
Detroit
Cleveland
Omaha
Kansas City
St. Louis
Arkansas R.
Canadian R.
Red R.
Guthrie
Dallas
Houston
Galveston
Mississippi R.
Tennessee R.
Ohio R.
Cincinnati
Louisville
Memphis
Atlanta
Macon
Mobile
New Orleans
Allegheny Mts.
Boston
C. Sable
New York
Philadelphia
Delaware Bay
Baltimore
Washington
Chesapeake Bay
Norfolk
Cape Hatteras
Wilmington
Charleston
Savannah
St. Augustine
Florida Pen.
Bermuda
Gulf of Mexico
Cape Sable
Florida Str.
Bahama Islands
Havana
Cuba
Yucatan Channel
Greater Antilles
Porto Rico (U.S.)
Haiti
Sto. Domingo
Port au Prince
Jamaica (Br.)
Kingston
West Indies
Caribbean Sea
Tropic of Cancer
Rio Grande
Lower California
Gulf of California
Magdalena Bay
Cape San Lucas
Revilla Gigedo Is.
Mexico
Sierra Madre
Monterey
S. Luis Potosi
Guadalajara
Mexico
Popocatapetl
Acapulco
Vera Cruz
Gulf of Campeche
Merida
Yucatan Pen.
Campeche
Isthmus of Tehuantepec
Brit. Honduras
Belize
Honduras
Tegucigalpa
New Guatemala
Guatemala
San Salvador
Salvador
Nicaragua
Managua
Lake Nicaragua
San Jose
Costa Rica
Central America
Isthmus of Panama
Colon
Panama Canal
Panama
South America
Equator
Longitude West from Greenwich
130° 120° 110° 100° 90° 80° 70°
Williams Engraving Co., N.Y.

FIG. 4.

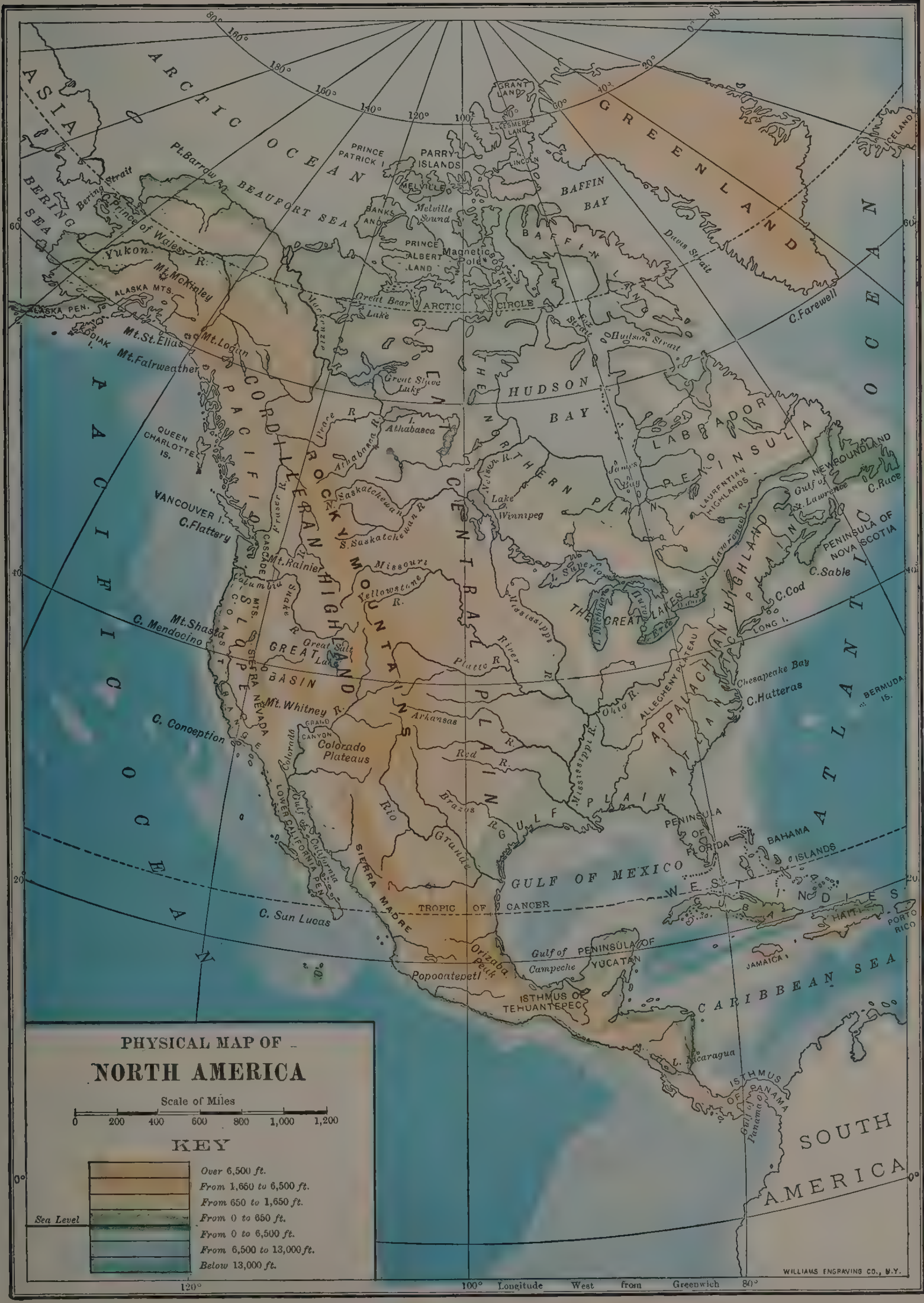
PHYSICAL MAP OF
NORTH AMERICA
Scale of Miles
0 200 400 600 800 1,000 1,200
KEY
Over 6,500 ft.
From 1,650 to 6,500 ft.
From 650 to 1,650 ft.
From 0 to 650 ft.
Sea Level
From 0 to 6,500 ft.
From 6,500 to 13,000 ft.
Below 13,000 ft.
ARCTIC OCEAN
ASIA
BERING SEA
Bering Strait
Pt. Barrow
BEAUFORT SEA
PRINCE PATRICK I.
PARRY ISLANDS
MELVILLE
BANKS AND
Melville Sound
PRINCE ALBERT LAND
Magnetic Pole
BOOTHIA
GRANT LAND
ELLESMERE LAND
LINCOLN
BAFFIN BAY
BAFFIN LAND
GREENLAND
ICELAND
Davis Strait
C. Farewell
Fox Strait
Hudson Strait
HUDSON BAY
ARCTIC CIRCLE
Great Bear Lake
Great Slave Lake
Mackenzie R.
Yukon R.
Prince of Wales
ALASKA MTS.
Mt. McKinley
ALASKA PEN.
KODIAK I.
Mt. St. Elias
Mt. Logan
Mt. Fairweather
CORDILLERAN HIGHLAND
PACIFIC SLOPE
ROCKY MOUNTAINS
QUEEN CHARLOTTE IS.
VANCOUVER I.
C. Flattery
CASCADE MTS.
Mt. Rainier
Columbia
Snake R.
COAST RANGE
SIERRA NEVADA
Mt. Shasta
C. Mendocino
GREAT BASIN
Great Salt Lake
Mt. Whitney
C. Conception
GRAND CANYON
Colorado
Colorado Plateaus
LOWER CALIFORNIA PEN.
Gulf of California
SIERRA MADRE
C. San Lucas
Popocatepetl
Orizaba Peak
PACIFIC OCEAN
Peace R.
Athabasca R.
L. Athabasca
Fraser R.
N. Saskatchewan
S. Saskatchewan R.
Nelson R.
Lake Winnipeg
Missouri
Yellowstone R.
Platte R.
Arkansas
Red R.
Brazos
Rio Grande
CENTRAL PLAIN
GREAT CENTRAL PLAIN
NORTHERN PLAIN
Mississippi River
Mississippi R.
Ohio R.
L. Superior
L. Michigan
Huron
Erie
THE GREAT LAKES
St. Lawrence R.
James Bay
LABRADOR PENINSULA
LAURENTIAN HIGHLANDS
NEWFOUNDLAND
C. Race
Gulf of St. Lawrence
PENINSULA OF NOVA SCOTIA
C. Sable
C. Cod
LONG I.
APPALACHIAN HIGHLAND
ALLEGHENY PLATEAU
Chesapeake Bay
C. Hatteras
BERMUDA IS.
ATLANTIC PLAIN
ATLANTIC OCEAN
GULF PLAIN
PENINSULA OF FLORIDA
BAHAMA ISLANDS
GULF OF MEXICO
TROPIC OF CANCER
WEST INDIES
CUBA
HAITI
PORTO RICO
JAMAICA
CARIBBEAN SEA
Gulf of Campeche
PENINSULA OF YUCATAN
ISTHMUS OF TEHUANTEPEC
L. Nicaragua
ISTHMUS OF PANAMA
Gulf of Panama
SOUTH AMERICA
80° 160° 180° 160° 140° 120° 100° 80° 60° 40° 20° 0° 80°
60° 40° 20° 0°
120° 100° Longitude West from Greenwich 80°
WILLIAMS ENGRAVING CO., N.Y.

FIG. 5.

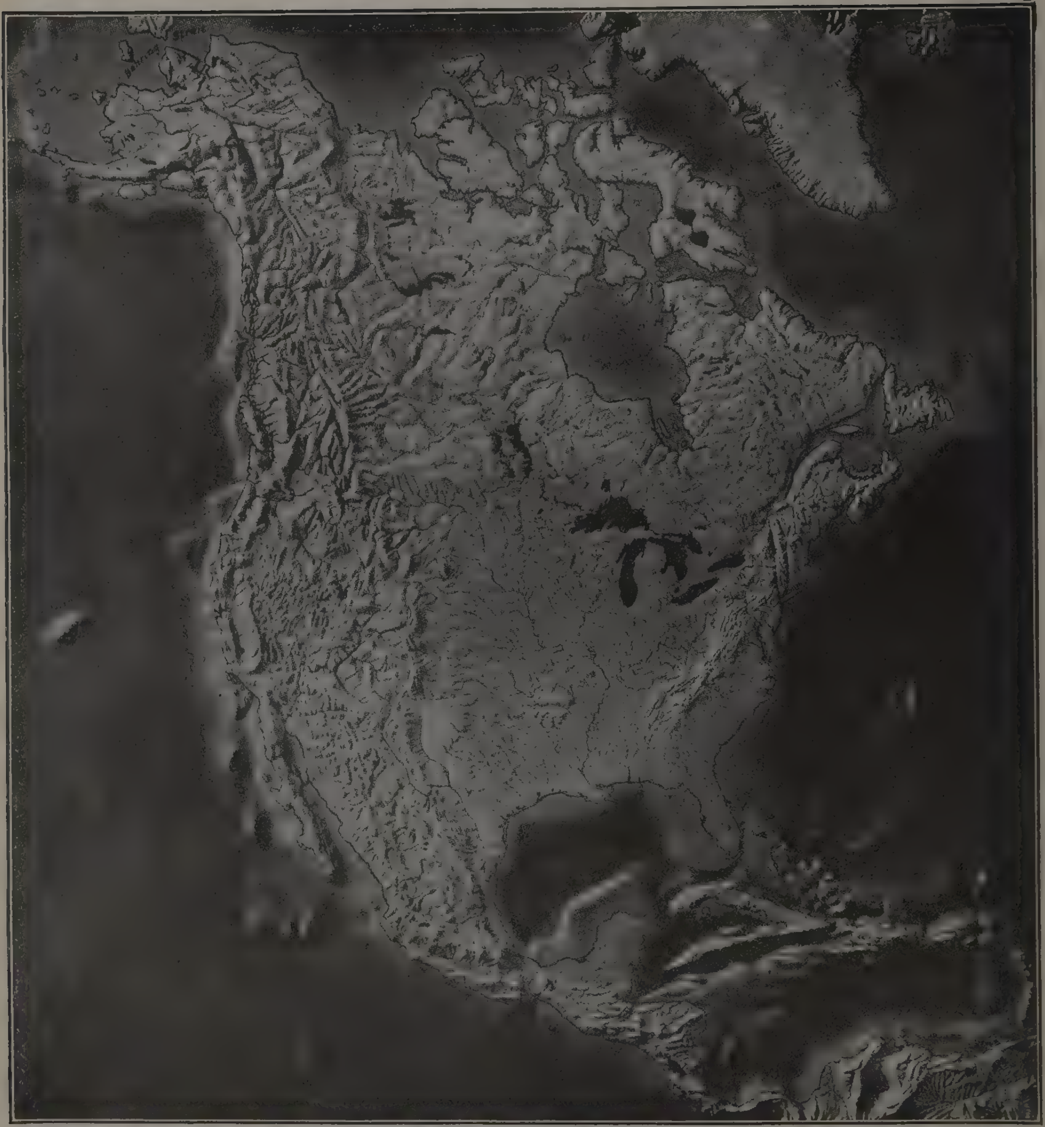

FIG. 6. — Relief map of North America.

formed on the eastern side of the continent and the Rocky Mountains on the western side (Fig. 6).

The fact that these two systems extend north and south rather than east and west is of the greatest importance. How that is true will be made clear when the winds and rains are studied. Mountains have a great influence on the rains.

Formation of our coast line

Our coast line has greatly changed in appearance as the land has risen or sunk, just as other parts of the continent have changed.

Changes in the coast line are even now in

1. Changes in the coast

progress in many places, though the process is very slow. For instance, the land along the coast of New Jersey is sinking at the rate of about two feet a century. The peninsulas of Labrador and Nova Scotia, and the hundreds of islands along the northeastern coast, have been formed by the sinking of the land. The irregular Pacific coast, from Puget Sound northward, was caused in the same way.

On the southern coast the land has been rising. Just off that coast is a broad ocean-bottom plain, where the water is shallow (Fig. 5). That part of the Southern States which borders the Gulf of Mexico and the Atlantic Ocean was once a portion of this ocean bottom, but it has been raised, until it is now a low plain. The Florida Peninsula has been formed in this way.

2. Effects of these changes

These changes have had important effects. For the sinking of the land allows the ocean water to enter the valleys and form exclusive bays and fine harbors. The Gulf of St. Lawrence was made in this manner; and in like fashion were made New York, Delaware, Chesapeake, and San Francisco bays, as well as many excellent harbors on the east and west coast.

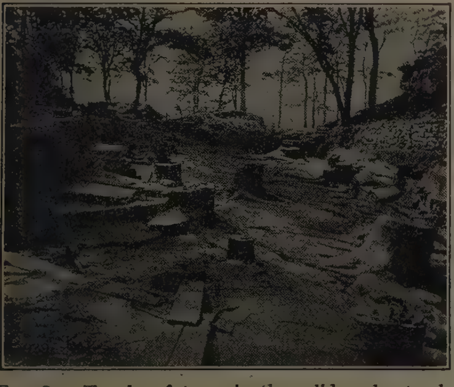

Fig. 8. — Trunks of trees, in the solid rock, standing where they grew when these rocks were being deposited as sediment in the Coal Period.

Where the land has been rising, however, the bays have become more shallow and the harbors poorer. That explains why the southern coast has fewer good harbors than that farther north.

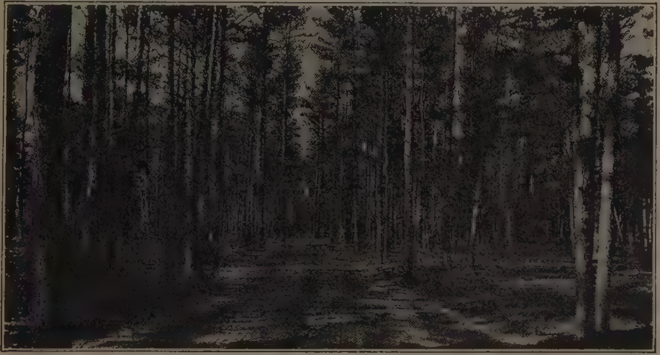

Fig. 7. — A view on the level coastal plain — once a sea bottom — which borders the coast south of New York.

Early plant life

After the great mountain systems in the East and West were formed, and the plains between them first rose above the surface of the ocean, many other changes followed. The rocks crumbled and formed soil out of which plants grew in great abundance. We know that they were very different from those now here, because some of their remains, in the form of fossils, have been preserved in the rocks. Figure 7 shows how some of the forests may have looked.

Formation of coal

Among the most interesting, and by far the most valuable, of the remains of plant life preserved in the rocks is the substance we call coal.

1. What it has been made from

Coal is simply the wood of forests that has been slowly changed to the form in which we now see it. There are many proofs of this. The roots of trees and other plants are still to be seen in many places in the solid rock, beneath the beds of coal (Fig. 8). This

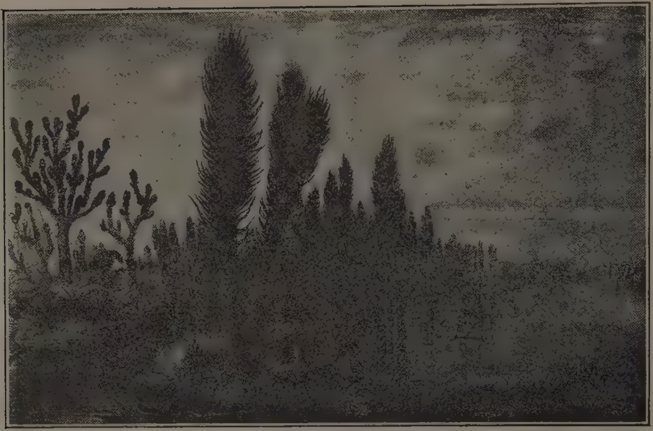

Fig. 9.—A view showing how the forests of the Coal Period probably looked.

solid rock was once soil, in which the roots grew. Sometimes the stems of plants and even whole trunks of trees are found in the coal beds, so slightly changed that they can readily be recognized, and sometimes fossil leaves and ferns can be plainly seen in the coal.

2. How it was formed

The way in which the coal was formed is well understood. For ages both land and air were very moist and warm, and dense forests grew in immense swamps. Meanwhile the earth was cooling off inside and shrinking; and this shrinking caused portions of the earth's crust to rise for a time, and then to sink again. When one of the great swamps, with its dense vegetation, sank below the surface, the vegetation died and fell, and was in time covered with sand, gravel, and mud, which have since hardened into rock. Above the rock, after many years, another swamp may have formed, bearing as dense a vegetation as the former one; and it, too, in turn sank and became covered over with a layer of rock. Thus one layer of vegetation after another became buried deep in the earth, and the immense pressure from the earth above has slowly changed all this vegetation into coal.

The Ice Age

1. Changes in climate long after the Coal Period, and the result

During the Coal Period the climate here was very warm and damp, so that there were many forms of life. Ages after, a great change came about, which has had a vast influence in determining the character of the surface of the continent, and the life that now exists here. For some unknown reason the temperature changed, so that all the northern part of the continent became covered with a sheet of ice, or a *glacier*, which moved slowly toward the south over the land, destroying all life, and working great changes in the surface.

2. The Greenland Glacier

Such glaciers are still found in some parts of the world, as in Greenland, in Alaska, and in the Alps Mountains of Europe. Probably the largest of these is the Greenland Glacier, which is fifteen times as large as the State of New York. This has been caused by snow which has fallen in great quantities and has then been turned into ice by pressure from above.

Fig. 10.—A rock containing fossils.

3. How a glacier moves and what it does

Ice formed in this way is not entirely solid. It is more like wax; and, as the pressure condenses it, it spreads out or "flows" slowly over the surrounding surface, just as a sheet of wax might do if a heavy weight were placed upon it.

FIG. 11.—Deposit made by the Greenland Glacier.

The movement is so slow that, for many years, scientists did not believe that glaciers flowed at all. As a glacier moves along it scrapes the soil from the underlying rocks, breaks off great pieces of the rocks themselves, and scours the surface of those that remain as would an immense piece of sandpaper. When it reaches the sea, huge masses of ice break off and float away, making what are called *icebergs*.

4. Extent of the great glacier

The glacier that formerly covered the northern part of North America was like the one now found in Greenland. It spread over the entire eastern part of the continent as far south as the Ohio River and as New York City. In the northwest it did not extend so far south, as you can see from the map, Fig. 12.

5. How the glacier changed the surface

This mass of ice was more than a mile in depth. Try to imagine its enormous weight as it slowly moved along. You can understand how it must have plowed all the soil from the rocks, and scratched and grooved and polished wherever it went.

Now and then the heat was great enough to stop its further progress by melting the ice as rapidly as it advanced. Then the glacier dropped in heaps great quantities of rock and soil that it had dragged to that point. These heaps, which are found in many parts of North America, are called *moraines*. Some of these moraines are hills hundreds of feet in height. Sometimes the glacier built a moraine in one place, and then, for some unknown reason, moved on again and deposited other moraines farther south. Sometimes it seems to have melted far away toward the north; but every time its advance was checked, it marked the place by moraines.

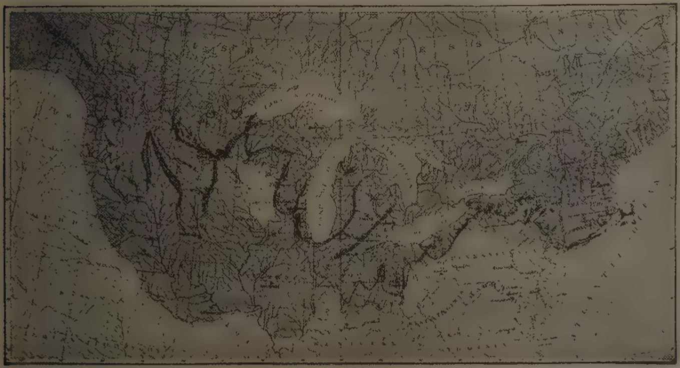

FIG. 12.—Map showing by shading the extent of the glacier in eastern United States.

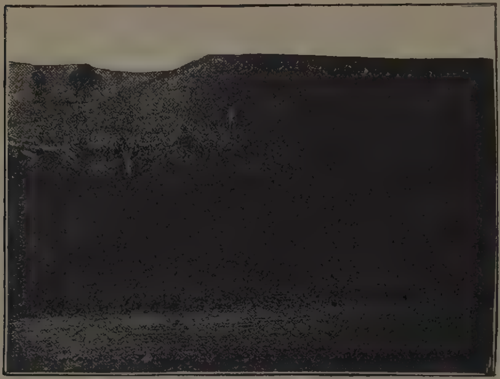

FIG. 13. — Moraine hills, near Ithaca, N.Y.

6. Present-day effects of the glacier's work

This great ice sheet lasted thousands of years, and, during that time, it carried away millions upon millions of tons of clay and rock, leaving the rocks bare in one place, building hills in another, and even digging out lakes in a third.

(1) *Upon our lakes*

The great number of lakes in the northern and eastern parts of North America we owe to this glacier. Minnesota alone has some twelve thousand, and New England several thousand more. Many of these are due to the irregular way in which the moraines were left, the water collecting in the hollow places. Some were caused by moraines that were dropped across river beds, forming dams. And some of the largest, like our Great Lakes, were partly dug out of the rock by the tremendous force of the glacier.

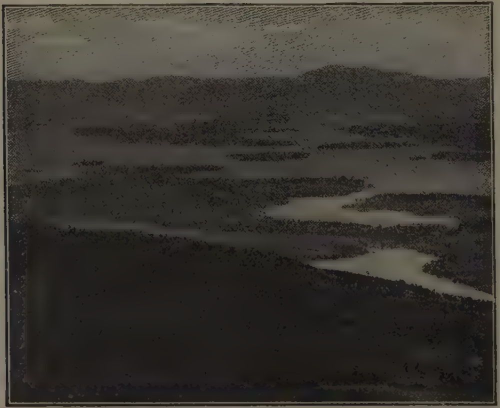

FIG. 15. — Lake Winnepesaukee, one of the lakes caused by the Great Ice Sheet.

(2) *Upon our manufacturing*

The effects of the glacier upon modern life are many. By damming up old river courses it caused many streams to seek new channels. These often ran over high ledges and steep rocks. Many of the cataracts and waterfalls that now furnish power for the factories of New York and New England were caused in this way. Niagara Falls is the greatest of them.

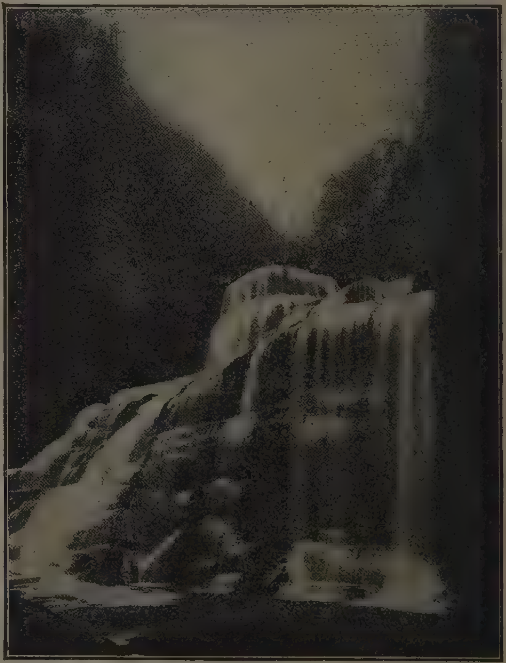

FIG. 14. — Falls made by glacier, New York State.

(3) *Upon our soil*

Another very important effect of the glacier was that upon our soil, and therefore upon our farming. In many parts of the country the soil has been made by the decay of rock. But in the region which the glacier covered, the decayed rock was swept away, and another kind of soil, called drift, was brought by the glacier and left in its place. This soil was made by the grinding of rocks together, much as flour is made by grinding wheat; in fact, glacier soil is sometimes called rock flour. In some places the layer of drift that the glacier left is several hundred feet deep.

Review Questions

1. What can you say about the size and shape of North America? 2. What changes has the continent gone through? 3. How did the continent probably begin? 4. Tell about the making of our principal mountains. 5. The changes in the coast. 6. Effects of these changes. 7. The early plant life. 8. What has coal been made from? Give proof. 9. How was this done? 10. Describe the glacier now found in Greenland. 11. How does a glacier move, and what work does it do? 12. What part of North America did the great ice sheet cover? 13. How did it change the surface? 14. What were the effects of the glacier's work upon our lakes? 15. Upon our manufacturing? 16. Upon our soil?

Suggestions

1. Make a collection of different kinds of coal. 2. Examine some pieces of *soft* coal closely, to see if you can discover plant remains. 3. Examine layers of rock in your neighborhood, to see if they contain fossils. 4. What becomes of the Greenland icebergs? 5. Make a sketch map showing the extent of the Great American Ice Sheet. 6. What signs of the glacier, if any, can you find in your neighborhood? 7. Draw an outline map of the northeastern coast, and another of the southern coast, to see how they differ.

II. PLANTS, ANIMALS, AND PEOPLES OF NORTH AMERICA

1. Plants and Animals

Influence of climate on plants and animals

One of the most important things to know about a region is its *climate*, that is, its temperature and rainfall. Where these are favorable, plants usually flourish; and since plants furnish food to animals, animal life thrives wherever vegetation is abundant. Because North America extends far north and south, and has lofty mountain ranges and inclosed plateaus, it has many different kinds of climate. Therefore it has a great variety of plant and animal life.

Plants of the Far North

The northern part of our continent is bitterly cold; and over a vast area the soil is always frozen, except at the very surface, where it thaws out for a few weeks in summer. On account of the frost, trees, such as we know, cannot grow there, for their roots are unable to push through the frozen ground and find the necessary plant food. There are some willows, birches, and a few other woody plants; but instead of growing to a good height, as our willows and birches do, these creep along the surface like vines, and rise but a few inches above the ground. Only by hugging the earth can they find protection beneath the snow, and thus escape the fierce blasts of winter.

Animals of the Far North

1. Insects

The growth of insects in summer is rapid, like the growth of plants. As the snow melts, and the soil thaws at the surface, the ground becomes wet and swampy, and millions of insects appear. Among them the most common is, perhaps, the mosquito. There are few parts of the world where this creature is a worse pest than on the *barrens*, or *tundras*, as these treeless, frozen lands of northern North America, Europe, and Asia are called.

2. Larger animals on land

Few large land animals thrive in so cold a climate, where there is such a scarcity of plant food; and the cold-blooded animals, or reptiles, cannot live there. The reindeer, or caribou, the musk-ox, and polar bear are the largest four-footed land animals; and the crow, sparrow, and ptarmigan are the most common land birds.

3. Sea animals

Many more animals have their homes in the sea than upon the land, because there, except at the very surface, the temperature never goes below the freezing point. Therefore there are plenty of sea animals of all sizes, from those

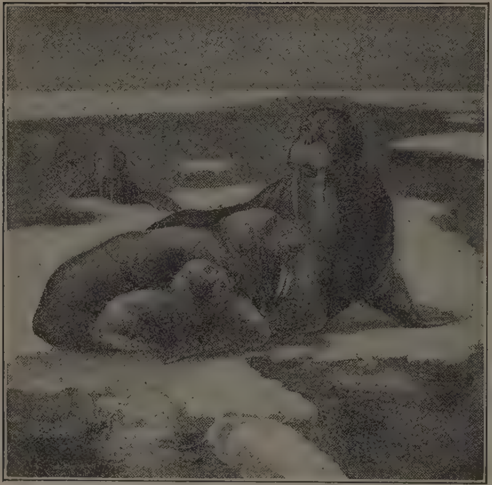

FIG. 16. — Walrus on the ice that is ever present in the Arctic Ocean.

so small that they cannot be seen without a microscope, to the whale, the largest of all animals.

Sea birds exist by tens of thousands, building their nests upon the rocky cliffs. Indeed, they are so numerous that, when suddenly frightened by the firing of a gun, they rise in a dense cloud that hides the sun; and with their cries they produce a din that is almost deafening.

Seals and walruses live in the water, the former being so valuable for their oil and skins that men go on long voyages to obtain them. The oil comes from a layer of fat, or "blubber," just beneath the skin, that serves to keep out the cold. The seal is the most common of the larger Arctic sea animals, and is the principal food of the Eskimo, as well as of the polar bear.

Plants and animals of the temperate zone

1. In the arid West

A large area in the western part of the United States and in Mexico has a very slight rainfall, although the temperature is agreeable. This arid area includes most of the territory in which the rainfall is twenty inches or less during one year. In some places, as near the Pacific coast and upon the high plateaus and mountain tops, there is rain enough for forests; but in most parts of the Far West the climate is so dry that there are no trees whatsoever. Indeed, some portions are true deserts.

(1) *Plants of this region*

One common plant in the arid lands is the bunch grass, so called because it grows in little tufts, or bunches, having a dozen or more blades. The sagebrush (Fig. 17), a plant with a pale green leaf, named because of its sagelike odor, is found throughout most of this arid region. Other common plants are the mesquite; the century plant, with its sharp-pointed leaves; and the cactus, with its numerous thorns.

(2) *How these plants manage to live*

On account of the dry climate, these plants have a severe struggle to live, and they protect themselves in peculiar ways. For example, the cactus, unlike most plants, has no true leaves. Thus it exposes little surface to the air for evaporation. In its great, fleshy stem, it stores water for use through the

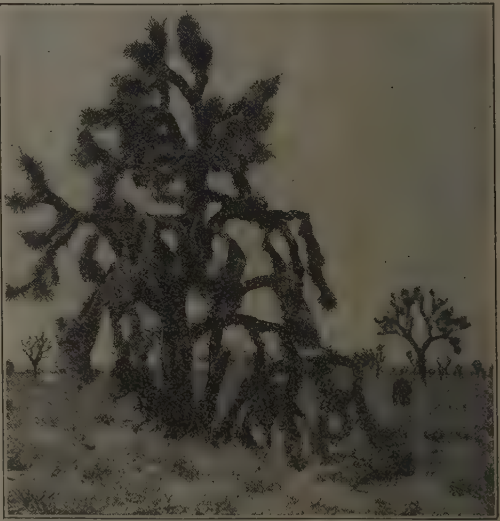

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FIG. 17. — A view in the desert of Southern California. The low plants are sagebrush; the higher ones, with spiny branches, are Yucca.

long, dry seasons, while its needle-like spines protect it from animals in search of food.

(3) *Animals of this region*

The graceful antelope, the cowardly prairie wolf, or *coyote*, and the rabbit, upon which the coyote feeds, are still to be seen. Among the rabbits is the long-legged jack rabbit, which leaps across the plains with astonishing speed.

The fierce puma, or mountain lion, and the ugly-cinnamon and grizzly bears still live among the mountains, though they are now rare and difficult to find. Deer and elk inhabit the forest-covered mountains of southern Canada and the northwestern part of the United States; and among the higher peaks a few mountain goats and sheep are still to be found.

FIG. 18. — A wild deer on the edge of the forest.

2. In other parts of temperate North America

(1) *Plants of this region*

Between the frigid and torrid zones, and both east and west of the arid region, is a temperate belt of *moderate* rainfall. The climate is warm in the south, cool in the central part, and cold in the north. Here both the plants and animals differ from those of the arid regions.

In the warm southern part, the plant and animal life is abundant, and of many kinds. Both plants and animals become less numerous and less varied toward the north, until, near the Arctic zone, they are scarce and few in kind. The pines and oaks of the United States give place to the spruce, balsam fir, and maple in Canada; farther north these gradually become stunted and disappear; and finally the treeless barrens are reached.

(2) *Animals of this region*

When America was first visited by Europeans, our woods abounded in deer (Fig. 18), moose, caribou, wolves, and foxes. Beavers built dams across the streams; the mink and otter fished in the waters; and bears roamed at will. Among the birds, the eagle was common, and wild pigeons and turkeys were so abundant that they were one of the principal foods of the early settlers.

Now most of these animals have been destroyed, although some still live in the forest and mountain region. Some of them, like the deer, are now carefully protected by state laws, which prohibit shooting them except at certain seasons, and then only in small numbers. In the forests of Canada and in Alaska, many wild animals are still left.

Plants and animals in the torrid zone

1. The plants in this region

In the torrid zone, the climate is warm or hot, and in most parts the rainfall is so heavy that the conditions are favorable for dense vegetation. Indeed, the tangle of growth in the forests is so great that it is often impossible to pass through it without hewing one's way. Besides trees and underbrush, there are quantities of ferns, vines, and flowers, many of which hang from the trees with their roots in the air instead of in the ground. They are able to live in this way on account of the moisture in the air. Among the trees are the valuable rosewood, mahogany, ebony, and rubber tree, and among the flowers are the beautiful orchids. On account of the continual warmth and dampness, many plants, such as the banana, bear fruit throughout the year.

In the midst of such luxuriant vegetation,

2. The animals in this region

animal life is wonderfully varied and abundant. There are the tapir, monkey, and jaguar; brilliantly colored birds, such as parrots and humming birds; and there are millions of insects. Scorpions and centipedes abound, and ants exist in countless numbers, some in the ground, others in decayed vegetation. Serpents, some of which are poisonous, are common in the forests; and in the rivers are fish and alligators, the latter being found as far north as Florida and Louisiana.

2. Peoples

The Eskimos

America was inhabited for thousands of years before it was discovered by white men. To the natives in the southern part Columbus gave the name *Indians*, in the belief that he had reached India. Those in the Far North, who live on meat, are called *Eskimos*, a word meaning flesh-eaters (Fig. 19). What do you recall about their manner of life from your study of the First Book?

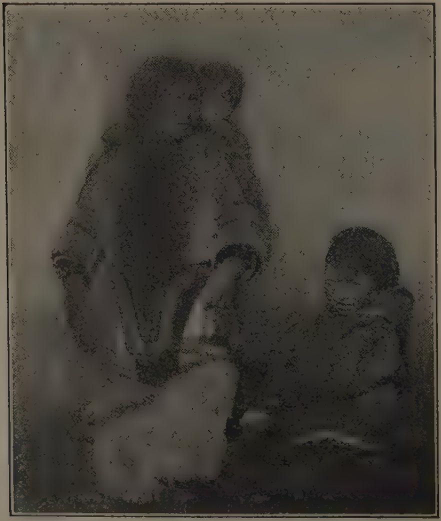

Fig. 19. — An Eskimo mother and her children. The very young children are carried on the back in a sealskin hood.

Fig. 20. — An Indian woman and child.

The Indians

Indians were at first scattered over most of the country south of the Arctic Circle. That this was so is suggested by the many places that bear Indian names, such as Narragansett, Erie, Niagara, Huron, Ottawa, Illinois, Dakota, Pueblo, and Sioux City.

Some of the tribes were true *savages;* others, not so savage, may be classed as *barbarians*. The barbarians raised "Indian corn," pumpkins, and tobacco; they baked pottery, used tools and weapons made of stone, and lived in villages.

The Indians that were most nearly civilized lived in the southwestern part of what is now the United States, in Mexico, and in Central America. Much of that region is arid, but the Indians raised crops by irrigation, and built houses of stone and sun-dried brick. These houses, called *pueblos*, were used partly as homes for protection from the neighboring savages, and partly as storehouses for grain.

The Spaniards

The astonishment of Europe was great when it was proved that there were vast territories on this side of the Atlantic held only by savages. America was pictured as containing all sorts of treasures, and European nations outdid one another in fitting out expeditions to take possession of them.

The Spaniards naturally led, for at that time they were one of the most powerful nations of Europe; and besides, they had sent Columbus on his voyage of discovery. Columbus sailed from Palos, in Spain, on his first voyage, and his ships were carried by the winds southwestward to the West Indies, a point much farther south than Spain itself. On a globe find the point on our coast that is about as far north as Madrid.

The section reached by the Spaniards had a climate somewhat like that of their own country, and they easily made themselves at home there. Soon they came into possession of most of South America, Central America, Mexico, and the southwestern part of the United States. The Spaniards had one advantage over the English and French, who settled farther north; the portion of the continent that they discovered is so narrow that they easily crossed it. Thus they were able to explore both the Atlantic and the Pacific coasts. It was largely because of this fact that the Spanish settled the western coast as far north as San Francisco.

The French

The French began their settlements in a very different quarter, being early attracted to our coast by the excellent fishing on the Newfoundland Banks. Soon the fur trade with the Indians proved profitable, and the French took possession of Nova Scotia and the region along the St. Lawrence River and the Great Lakes.

The value of the fur trade, together with a desire to convert the Indians to Christianity, led the French as far west as Wisconsin and to the headwaters of the Mississippi River. Making their way southward to the mouth of that river, they took possession of the whole Mississippi Valley, calling it Louisiana in honor of their king, Louis XIV. In order to hold this vast territory, they established a chain of trading posts and forts from the Gulf of St. Lawrence to the Gulf of Mexico. One of the most important of these forts was built where Pittsburgh now stands. Many places in the St. Lawrence and Mississippi valleys still have French names; for example, Lake Champlain, Marquette in Michigan, La Salle in Illinois, St. Louis, and New Orleans. Can you name others?

The English

The Spanish and French left only a narrow strip along the Atlantic coast for other nations. Among those who made settlements there were the Dutch in New York, and the Swedes in Delaware; but the English soon obtained the lead. The English captured New York City (then called New Amsterdam) from the Dutch, and made settlements along most of the coast from Florida to Nova Scotia.

The territory now occupied by the English-speaking people

In several respects the portion that fell to the English seemed much less desirable than that held by the Spanish and French. Yet the English-speaking race has managed, not only to hold this, but even to add to it most of the possessions of the other two. At the present time, the control of the entire continent, except Mexico, Central America, and a few small islands, is in the hands of either the United States or Great Britain.

There are, of course, good reasons for this remarkable result. No doubt, differences in the characters of these three races is one cause. Yet there are others also, as is shown in the following paragraphs.

The temperate climate of the central portion of North America is one of the best in the world for the production of people of energy. The warm summers allowed abundant harvests; while the long, cold winters forced the settlers to work hard in order to store up supplies for the cold season; but, although they had to work a great deal, they still had time and energy left for improvement.

Again, the English were less cruel than the Spaniards in their treatment of the Indians; but, unlike both French and Spanish, most of the English would not intermarry with savages. Thus it happened that, in the wars with the French, the English could act with more intelligence, speed, and force; for they were not hindered by partly civilized half-breeds. There was one disadvantage, however: the Indians became enemies of the English, and in the wars between the English and French most of them fought on the French side.

Finally, the fact that the English were hemmed in by forest-covered mountains on the west, and by the French and Spanish on the north and south, also proved an advantage. On that account, they were kept close together; and when wars arose, they were better able to combine their forces.

These are some of the chief reasons why the English-speaking race has won its way on the continent against both the Spanish and the French.

Review Questions

1. What is the influence of climate on plants and animals? What can you tell about them? 2. What about the plant life in our western arid lands? 3. Describe the animal life in that region. 4. Describe the plant life in the temperate portion of North America outside of the arid lands. 5. Tell about the animal life in the same region. 6. What is the condition of plant life in the torrid zone? 7. Of animal life? 8. What was the condition of the Indians who formerly lived here? 9. What portion of the continent was taken possession of by the Spaniards? 10. What portion of the continent was taken by the French, and why? 11. Where were the earlier English settlements? 12. How much of the continent is now in control of English-speaking people? 13. Give some reasons for this remarkable fact.

Suggestions

1. Examine some century and cactus plants. 2. Find some furniture made of mahogany or other tropical wood. 3. Visit a greenhouse to see orchids. 4. Collect pictures of native plants and animals of North America. 5. Collect samples of different American woods.

III. THE UNITED STATES

1. General Facts

Location and area

On Figure 2 we see that the United States occupies the central part of North America, extending from ocean to ocean.

Aside from Alaska, which belongs to us, the only countries on our north are Canada, Newfoundland, and Greenland. On our south are Mexico and the several small countries of Central America. Trace our boundaries on the north and south. What portions are artificial? What portions natural? Is the distance across the United States greater from east to west or from north to south? How much greater?

The area of the United States is about 3,000,000 square miles, which is more than four times the area of Mexico. Yet ours is not the largest country on the continent, for the area of Canada is greater than that of the United States and Alaska together.

Population and its distribution in 1790

Figure 21 shows the part of the United States that was settled before 1790, when George Washington was President for the first time. What states do you find that had no inhabitants other than Indians? Which had only scattered settlements, such as forts and small villages? Each of the cities shown on this map had a population of over 5000. What are their names? How about Chicago and St. Louis? All together there were only a little over 3,000,000 white men here at that time.

Our present population is over 91,000,000. The present population of Canada is over 7,000,000, of Mexico about 15,000,000,

Our present population

and of Central America about 5,000,000. Not only have we more inhabitants than the other countries of North America combined, but we have more than all the countries of North and South America together. Ours has plainly been the favorite country for settlers in the New World.

Reasons for this rapid increase

This remarkably rapid increase in population has, to a large extent, been due to the number of foreigners who have come here to live.

1. Negroes

The early introduction of slavery has resulted in greatly increasing our numbers. There are now over 9,000,000 colored people in the United States, which is about one tenth of our entire population.

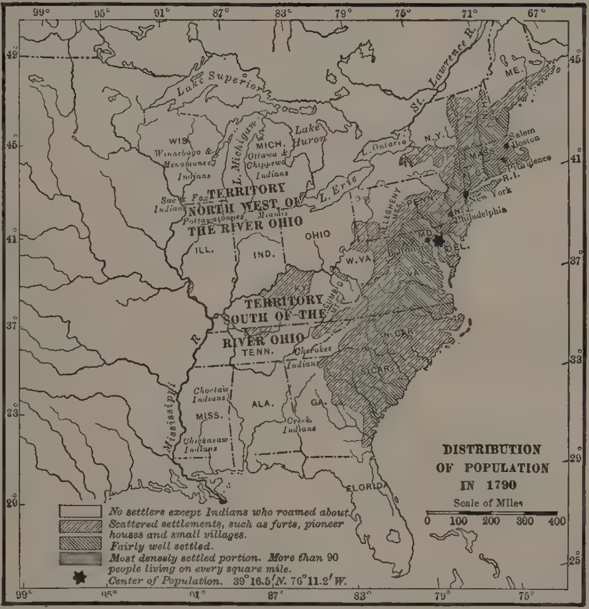

FIG. 21. — Distribution of population in the United States in 1790.

2. Immigrants from Europe and Asia

Europe and Asia have poured forth a steady stream of immigrants during the last one hundred years. Probably, in all, as many as 25,000,000 foreigners have come to our shores to live since 1790, and they are still coming at the rate of about a million a year. Nearly every foreign nation is represented, and upon the streets of our larger cities the languages of most of the civilized peoples of the globe may be heard.

The greater portion of our immigrants have come from northern Europe, especially from the British Isles, Germany, and the Scandinavian Peninsula; and many of them have settled in the cities. More recently a flood of immigration has come from southern Europe. At one time the Chinese began to come in great numbers, and laws preventing their coming had to be passed. We have laws, also, excluding paupers, criminals, diseased people, and laborers brought here by contract. To others the country is free.

Figure 22 shows the present distribution of our population. Where is the population

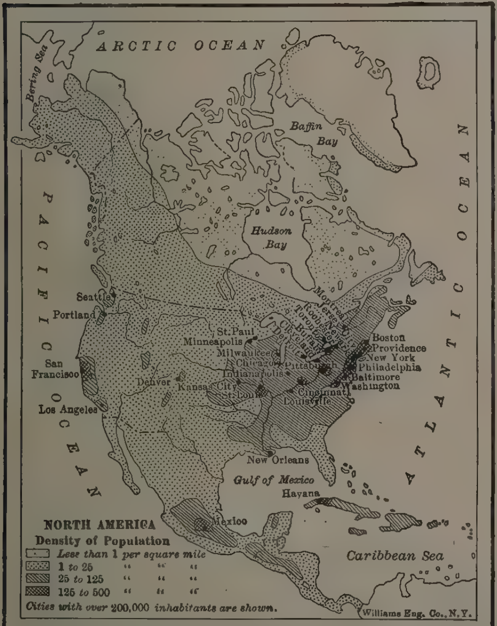

FIG. 22. — Density of population in North America at the present time.

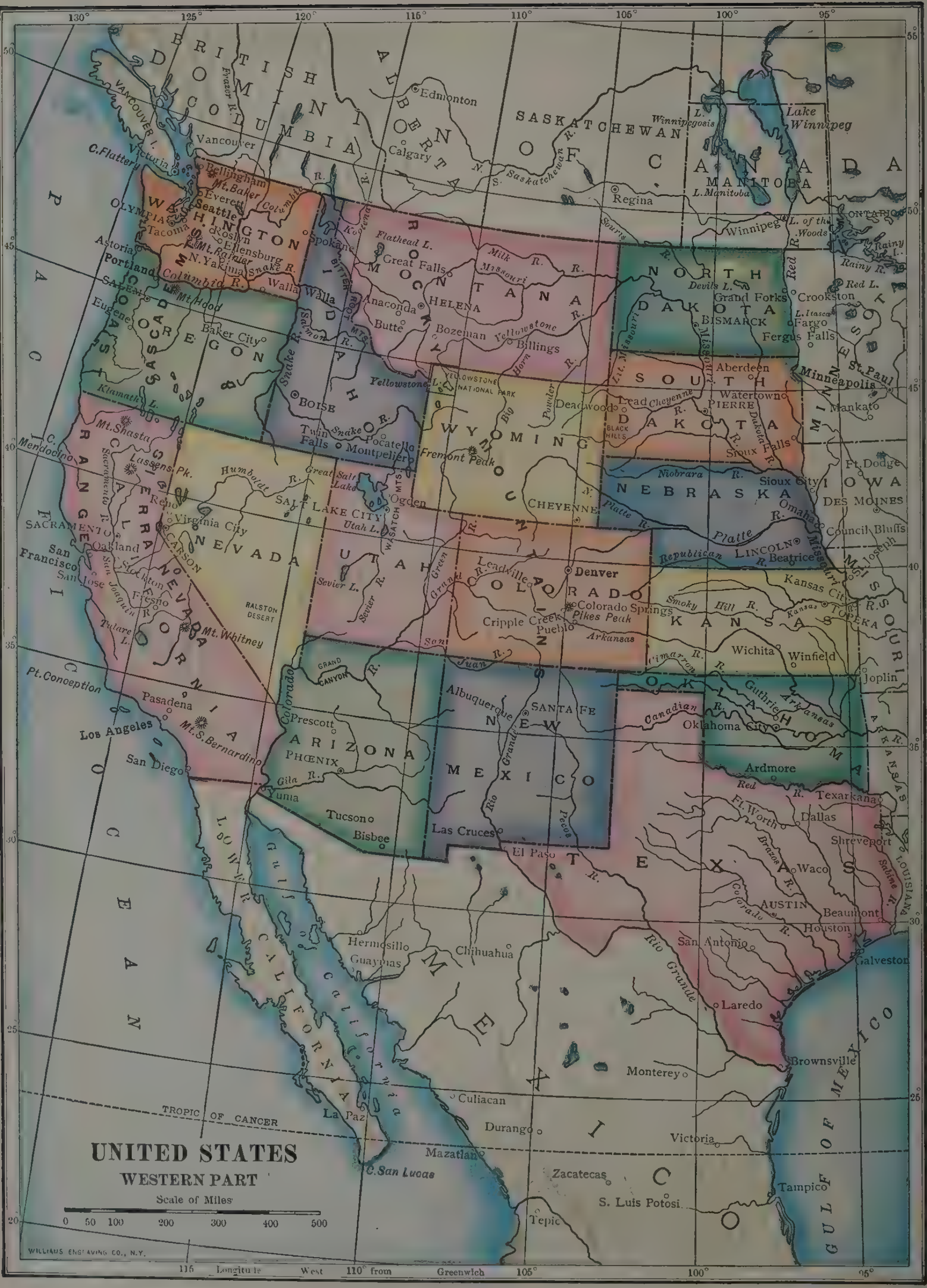
UNITED STATES
WESTERN PART
Scale of Miles
0 50 100 200 300 400 500
WILLIAMS ENGRAVING CO., N.Y.
Longitude West 110° from Greenwich
BRITISH COLUMBIA
DOMINION OF CANADA
ALBERTA
SASKATCHEWAN
MANITOBA
ONTARIO
Vancouver
Victoria
Edmonton
Calgary
Regina
Winnipeg
Lake Winnipeg
L. Winnipegosis
L. Manitoba
L. of the Woods
Rainy L.
WASHINGTON
OLYMPIA
Seattle
Tacoma
Bellingham
Everett
Spokane
N. Yakima
Walla Walla
OREGON
SALEM
Portland
Astoria
Eugene
Baker City
IDAHO
BOISE
Pocatello
Montpelier
Twin Falls
MONTANA
HELENA
Great Falls
Butte
Anaconda
Bozeman
Billings
NORTH DAKOTA
BISMARCK
Grand Forks
Fargo
SOUTH DAKOTA
PIERRE
Aberdeen
Watertown
Sioux Falls
Deadwood
Lead
WYOMING
CHEYENNE
YELLOWSTONE NATIONAL PARK
Fremont Peak
NEBRASKA
LINCOLN
Omaha
Beatrice
IOWA
DES MOINES
Council Bluffs
Sioux City
Ft. Dodge
MINNESOTA
St. Paul
Minneapolis
Mankato
Crookston
Fergus Falls
MISSOURI
St. Joseph
Kansas City
KANSAS
TOPEKA
Wichita
Winfield
COLORADO
Denver
Leadville
Colorado Springs
Pikes Peak
Cripple Creek
Pueblo
UTAH
SALT LAKE CITY
Ogden
Great Salt Lake
Utah L.
Sevier L.
NEVADA
CARSON
Reno
Virginia City
RALSTON DESERT
CALIFORNIA
SACRAMENTO
San Francisco
Oakland
San Jose
Stockton
Fresno
Los Angeles
Pasadena
San Diego
Mt. Shasta
Lassens Pk.
Mt. Whitney
Mt. S. Bernardino
C. Mendocino
Pt. Conception
C. Flattery
ARIZONA
PHOENIX
Prescott
Tucson
Bisbee
Yuma
GRAND CANYON
NEW MEXICO
SANTA FE
Albuquerque
Las Cruces
OKLAHOMA
Oklahoma City
Guthrie
Ardmore
TEXAS
AUSTIN
El Paso
Dallas
Ft. Worth
Waco
Houston
Galveston
Beaumont
San Antonio
Laredo
Brownsville
Texarkana
Shreveport
LOUISIANA
ARKANSAS
Joplin
MEXICO
Hermosillo
Guaymas
Chihuahua
Monterey
Culiacan
Durango
Mazatlan
Victoria
Tampico
Zacatecas
S. Luis Potosi
Tepic
La Paz
C. San Lucas
LOWER CALIFORNIA
Gulf of California
GULF OF MEXICO
PACIFIC OCEAN
TROPIC OF CANCER
COAST RANGE
CASCADE MTS.
SIERRA NEVADA
ROCKY MOUNTAINS
WASATCH MTS.
BITTER ROOT MTS.
Columbia R.
Snake R.
Missouri R.
Yellowstone R.
Platte R.
Arkansas R.
Red R.
Rio Grande
Colorado R.
Gila R.
Canadian R.
Pecos R.
Brazos R.
Sabine R.
FIG. 23.

FIG. 23.

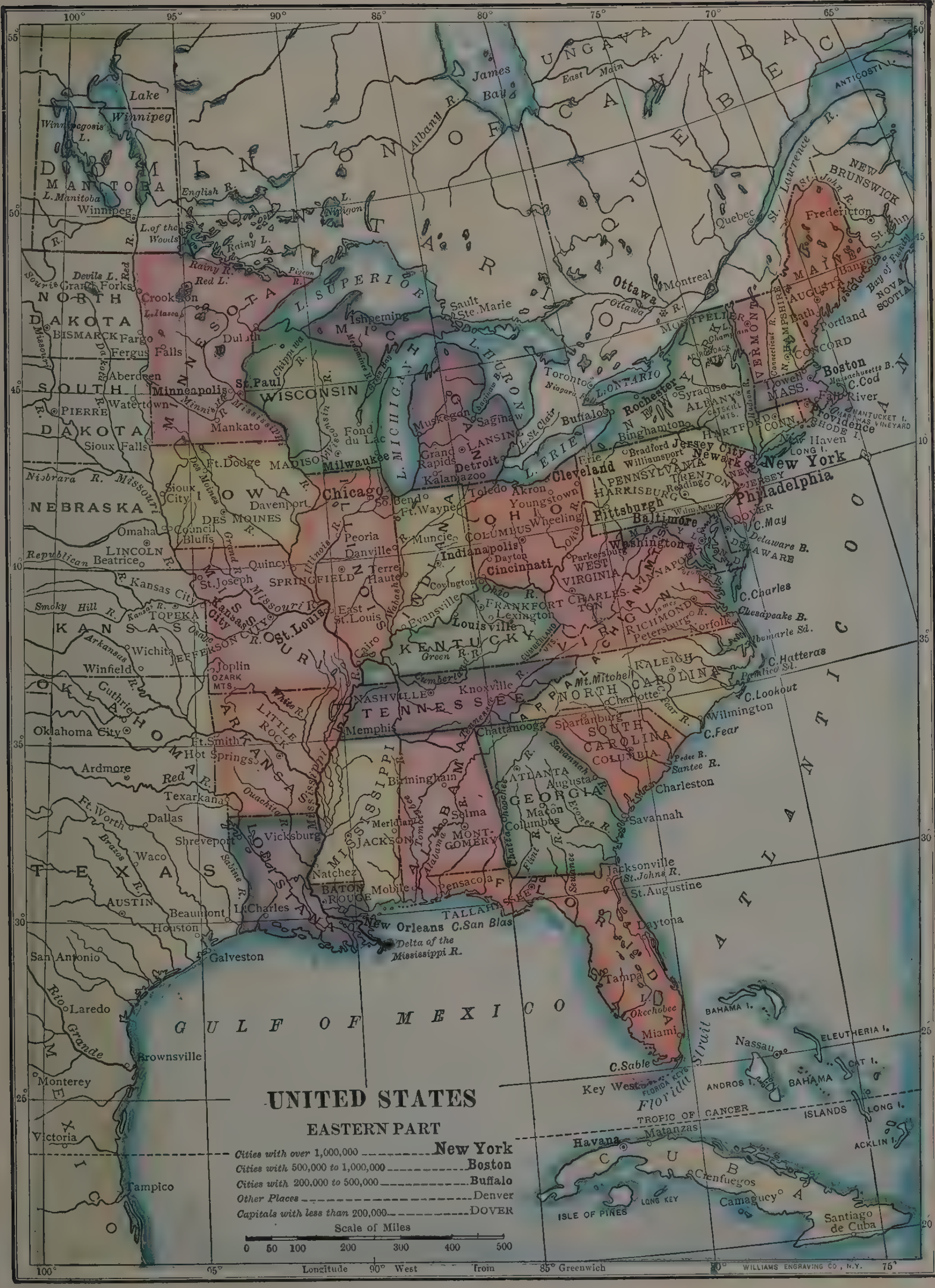
UNITED STATES
EASTERN PART
Cities with over 1,000,000 New York
Cities with 500,000 to 1,000,000 Boston
Cities with 200,000 to 500,000 Buffalo
Other Places Denver
Capitals with less than 200,000 DOVER
Scale of Miles
0 50 100 200 300 400 500
Longitude 90° West from 85° Greenwich
WILLIAMS ENGRAVING CO., N.Y.
DOMINION OF CANADA
ONTARIO
QUEBEC
UNGAVA
MANITOBA
NEW BRUNSWICK
NOVA SCOTIA
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
OKLAHOMA
TEXAS
MINNESOTA
IOWA
MISSOURI
ARKANSAS
LOUISIANA
WISCONSIN
MICHIGAN
ILLINOIS
INDIANA
OHIO
KENTUCKY
TENNESSEE
MISSISSIPPI
ALABAMA
GEORGIA
FLORIDA
SOUTH CAROLINA
NORTH CAROLINA
VIRGINIA
WEST VIRGINIA
MARYLAND
DELAWARE
NEW JERSEY
PENNSYLVANIA
NEW YORK
CONN.
RHODE I.
MASS.
VERMONT
N. HAMPSHIRE
MAINE
MEXICO
CUBA
BAHAMA ISLANDS
GULF OF MEXICO
ATLANTIC OCEAN
L. SUPERIOR
L. MICHIGAN
L. HURON
L. ERIE
L. ONTARIO
James Bay
Lake Winnipeg
TROPIC OF CANCER

FIG. 23.

C

Distribution of our population

most dense? Note that more than half of the whole country has, on the average, not more than twenty-five persons for each square mile. Point out this portion.

According to this map, which portion of North America has fewest settlers? What part of Canada is most densely populated? Of Mexico? Of Central America? Observe that the coast of the United States is most densely settled, while the coast of Mexico and Central America has few people, compared to the interior. Can you recall any explanation of this?

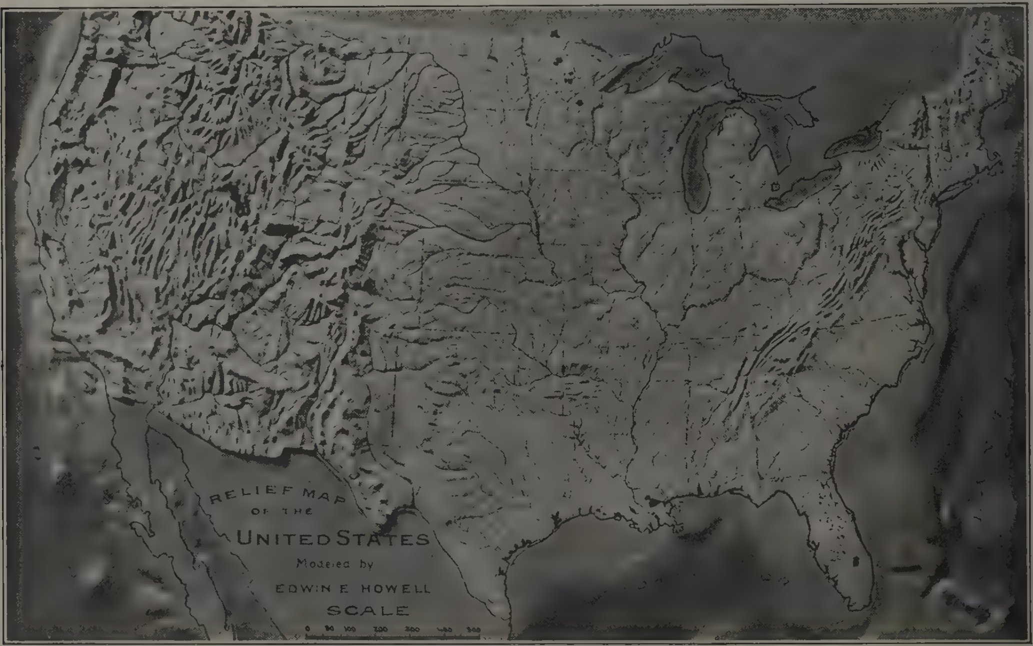

Fig. 24. — Relief map of the United States.

Reasons for such distribution

1. Immigrants came first to the East

It is natural that the eastern section of the United States should have been settled first, because most of the immigrants have come from Europe. Many of them, of course, have gone farther west, but many have remained in the great cities on the coast. Each large city there has its Italian quarter, its Russian quarter, its Jewish quarter, and so forth.

2. Many people collect at the best shipping and manufacturing points

The transportation of goods is one of the great industries, and this business alone has attracted large numbers of people to certain points. The best shipping points, moreover, are often the best manufacturing centers, for people manufacture goods at those places where raw materials can easily reach them, and where finished articles can be shipped away cheaply in all directions. The excellent shipping points, therefore, attract people because of the manufacturing as well as the commerce; for these industries give them work to do.

It is for these reasons that the fine harbors on our two coasts, and the best shipping centers on our interior waterways, have attracted the greatest number of people. On Figure 22 note the sections

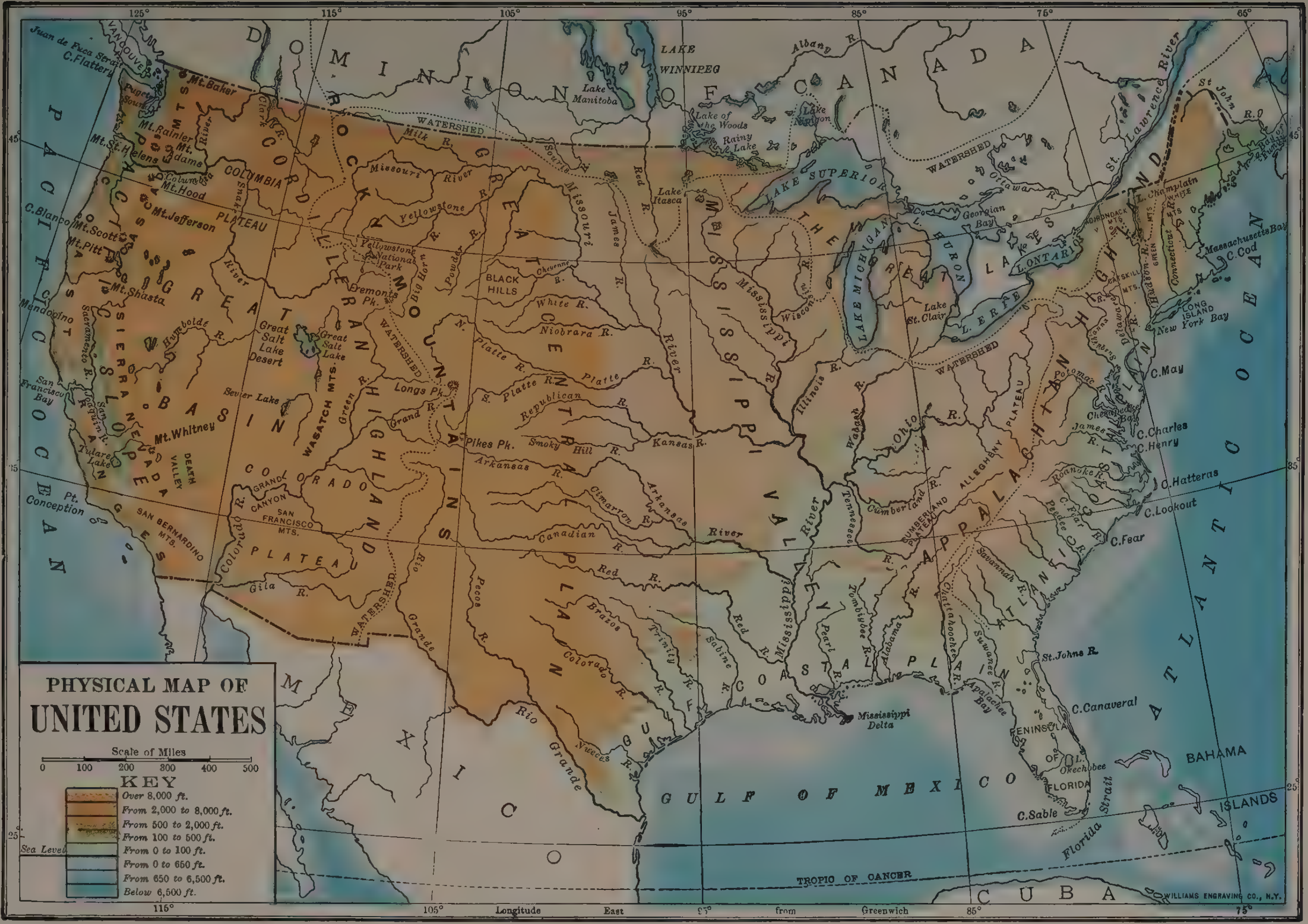
PHYSICAL MAP OF
UNITED STATES
Scale of Miles
0 100 200 300 400 500
KEY
Over 8,000 ft.
From 2,000 to 8,000 ft.
From 500 to 2,000 ft.
From 100 to 500 ft.
From 0 to 100 ft.
Sea Level
From 0 to 650 ft.
From 650 to 6,500 ft.
Below 6,500 ft.
DOMINION OF CANADA
PACIFIC OCEAN
ATLANTIC OCEAN
GULF OF MEXICO
MEXICO
CUBA
BAHAMA ISLANDS
ROCKY MOUNTAINS
CORDILLERAN HIGHLAND
GREAT BASIN
COLUMBIA PLATEAU
COLORADO PLATEAU
GREAT CENTRAL PLAIN
MISSISSIPPI VALLEY
THE GREAT LAKES
APPALACHIAN HIGHLAND
ALLEGHENY PLATEAU
CUMBERLAND PLATEAU
ATLANTIC COASTAL PLAIN
GULF COASTAL PLAIN
PACIFIC SLOPE
CASCADE MTS.
SIERRA NEVADA
SAN BERNARDINO MTS.
WASATCH MTS.
SAN FRANCISCO MTS.
BLACK HILLS
DEATH VALLEY
Mt. Baker
Mt. Rainier
Mt. Adams
Mt. St. Helens
Mt. Hood
Mt. Jefferson
Mt. Scott
Mt. Pitt
Mt. Shasta
Mt. Whitney
Fremonts Pk.
Longs Pk.
Pikes Pk.
Yellowstone National Park
Great Salt Lake
Great Salt Lake Desert
Sevier Lake
Tulare Lake
GRAND CANYON
Mississippi Delta
LAKE SUPERIOR
LAKE MICHIGAN
L. HURON
L. ERIE
L. ONTARIO
Lake St. Clair
Georgian Bay
LAKE WINNIPEG
Lake Manitoba
Lake of the Woods
Rainy Lake
Lake Nipigon
Lake Itasca
WATERSHED
Missouri River
Mississippi R.
Ohio R.
Tennessee
Cumberland R.
Arkansas R.
Red R.
Rio Grande
Colorado R.
Columbia R.
Snake R.
St. Lawrence River
C. Flattery
C. Blanco
C. Mendocino
San Francisco Bay
Pt. Conception
C. Cod
C. May
C. Charles
C. Henry
C. Hatteras
C. Lookout
C. Fear
C. Canaveral
C. Sable
Florida Strait
TROPIC OF CANCER
Longitude East from Greenwich
125° 115° 105° 95° 85° 75° 65°
45° 35° 25°
WILLIAMS ENGRAVING CO., N.Y.

FIG. 25.

that have the densest population. Our eastern coast, from Boston southwest to Washington, has more great centers of population than any other equal area in North America. Name several of them. What great cities do you find along the Great Lakes and the Mississippi River and its larger tributaries? There is a dense population, also, about San Francisco Bay, as there is around New York Bay, for a similar reason. Find other centers of dense population on the Pacific coast and in the interior.

3. Others are attracted to the best farming sections

(1) *Extent of the Mississippi Valley*

The greatest industry of all is farming, about one third of all the men of the United States being engaged in that one occupation. That fact largely explains the presence of so many people in the Mississippi Valley.

This broad trough between the mountain systems of the West and East is one of the most extensive fertile farming regions in the world. What is the length and breadth of this level region? There is only one mountainous section in this vast area, and that, called the Ozark Mountains in Missouri, extends also into Arkansas, Oklahoma, and Texas.

(2) *Its favorable climate*

Not only is this fertile region very extensive, but the climate is favorable to many kinds of farm products. On Figure 24 find the latitude of New Orleans. Note that it is not very far from the Tropic of Cancer, which marks the northern boundary of the torrid zone. How near does Florida come to that zone?

What is the latitude of our northern boundary? Observe how very far it is from that line to the Arctic Circle (Fig. 4), which marks the southern boundary of the frigid zone. It is plain not only that the United States lies in the temperate zone, but that it lies almost entirely in the southern half of that zone. That allows an abundance of heat in summer, even in the northern part of the Mississippi Valley. Thus the entire Mississippi Valley has a temperature that is very favorable to agriculture.

The rainfall is likewise favorable in most parts. Only far to the west of the Mississippi River, on the Great Western Plains (Fig. 24), is the quantity of rain too small for agriculture. From the Great Western Plains eastward to the Atlantic Ocean the rainfall is sufficient for good crops.

While the Mississippi Valley is the most extensive farming section in the United States, there is also much farming farther east and in the West. The favorable climate and good soil in the East, in the Mississippi Valley, and in parts of the West have helped greatly in attracting settlers.

4. Others, still, are drawn to the mining and grazing sections

(1) *Mining in the East*

Mining, as well as manufacturing, commerce, and farming, has attracted great numbers of people to the eastern half of the United States. Most of our hard coal is mined among the Appalachians of Pennsylvania. Most of our soft coal and iron ore, and much of our copper, also, are found east of the Mississippi River. These kinds of mining, therefore, increase the population in the East by many hundreds of thousands.

(2) *Mining in the West*

The mountainous section in the West, in which mining is important, is far more extensive than the Appalachians. This is the region of the Cordillera. Beginning at the Pacific coast (Fig. 24), you see the mountains called the Coast Ranges, parts of which rise abruptly from the water's edge. Eastward from these are the Sierra Nevada and Cascade ranges, in which there are many lofty peaks. Farther east are the Rocky Mountains, which extend entirely across the United States, into Canada and Alaska on the north, and far into Mexico on the south. Extensive plateaus, with short mountain ranges, lie between the Rocky Mountains and the Sierra Nevada-Cascade Range.

Find the names of the two principal plateaus on Figure 25.

There are many mines in this section, but they are scattered over the vast territory. The precious metals and much copper and other metals are found there; but far less coal and iron ore are mined in the West than in the Appalachians. The mining industry, therefore, has brought a much smaller and more scattered population to the Cordillera.

(3) *Grazing in the West*

In much of the western half of the United States grazing is the leading industry. That calls for a very small population, for reasons that you can give. Over wide areas grazing is the only industry, because much of the land is arid or desert. Find the Great Basin (Fig. 5), which is mainly desert. The reason for so dry a climate is that the principal winds for this region blow from the Pacific; and, since they lose most of their moisture on the high mountains, the lowlands and plateaus between the mountain ranges suffer from drought.

Figure 22 shows most of the western half of our country to be very thinly settled, but there are several places that have a dense population. Point them out. The special reasons why so many people have settled at these points you will learn later.

Reason for studying the United States in sections

Our country is so large that it is necessary to divide it into sections in order to study it in proper detail. Accordingly, the states have been grouped into four sections, of which the first is the Northeastern Group. The others, in their order, are the Southern States, the Central States, and the Western States.

Importance of watching the scale of maps

As you study each of these sections, a very important point to notice is the *scale* upon which each map is drawn. For example, in Figure 26, an inch and a quarter represents about one hundred miles. According to that scale, how long is the state of Connecticut? Find what the scale is on the map, Fig. 23. Using that scale, find the distance from New York to Buffalo. Using both maps, find the distance from Philadelphia to Boston, by way of New York. In studying a map, whether in this book, on the wall, or in an atlas, it is always important first to observe its scale.

Review Questions

1. State the location and area of the United States. 2. What was our population and its distribution in 1790? 3. What is our present population, and how does it compare with that of other countries in the New World? 4. How many colored people are there in the United States? 5. What immigrants are allowed to come here? How many have come, in all? 6. What is the present distribution of the population of North America? 7. Show why the place where the immigrants land is one reason for so great a population on our eastern coast. 8. Explain the influence of our best shipping and manufacturing points on the distribution of our people. 9. What farming sections have attracted great numbers of people? Give reasons. 10. How has mining affected the population in the East? 11. Why is the western half of the United States so thinly settled? 12. Show, by an example, that it is important when studying maps to observe the scale.

2. The Northeastern States

Map study

1. Name these states. Write the names. 2. Which has no seacoast? 3. Which state extends farthest east and north? Which farthest south? Which farthest west? 4. What natural boundaries do you find between them? 5. Which of them border on Canada? On the Atlantic Ocean? 6. What two large lakes form part of the boundary on the West? 7. What mountain system crosses these states? 8. Which states are most mountainous? 9. Name and trace the course of the chief rivers. 10. What do you observe about the direction in which the principal rivers flow? 11. Name and locate three lakes; three bays; three capes; and three islands. 12. To which state does Long Island belong? 13. Find New York City. Using the scale, find about how far it is from New York City to Boston. To Philadelphia. 14. Walk toward New York City. 15. In what direction would one have to sail from New England in order to reach England?

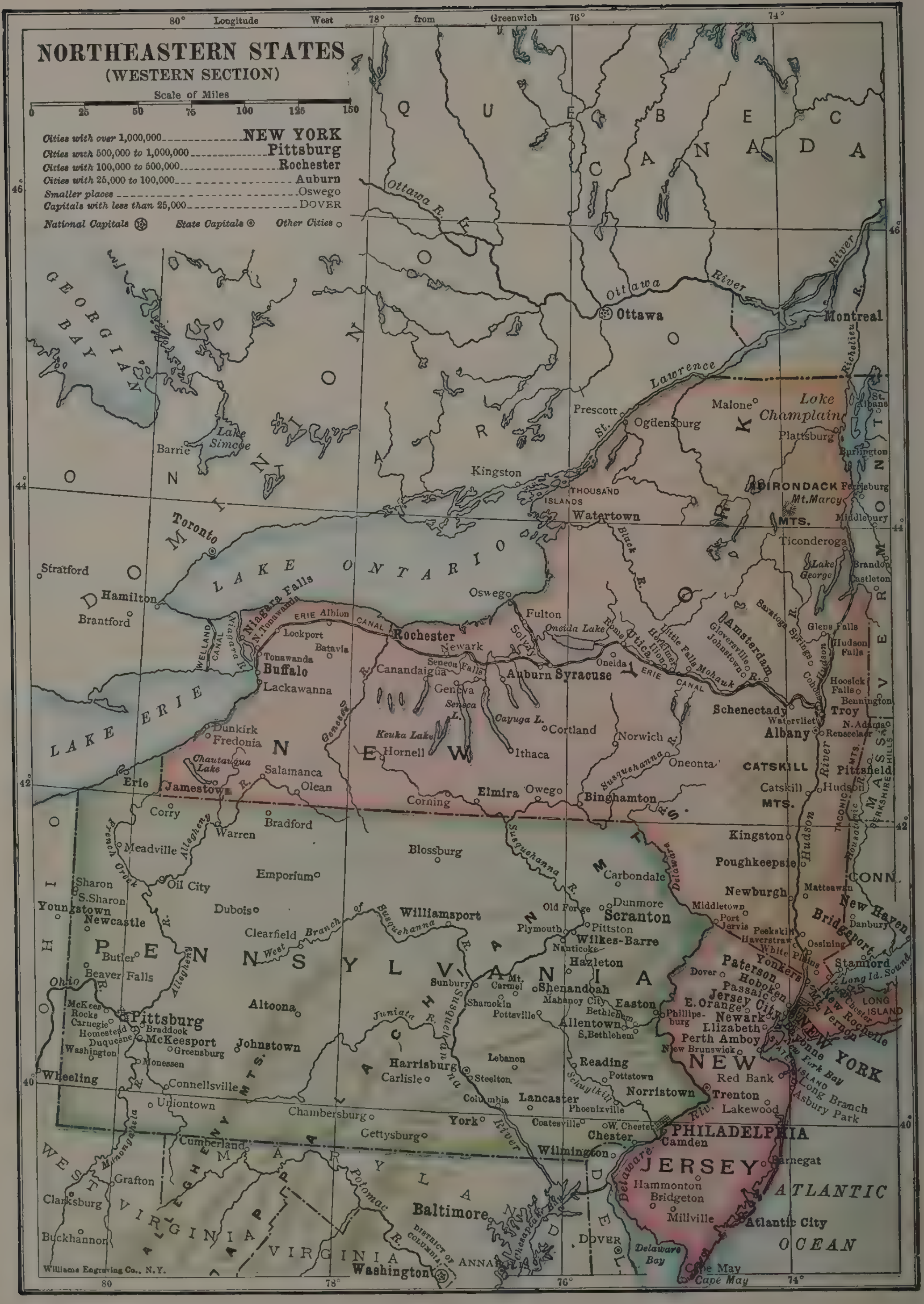
NORTHEASTERN STATES
(WESTERN SECTION)
Scale of Miles
0 25 50 75 100 125 150
Cities with over 1,000,000 NEW YORK
Cities with 500,000 to 1,000,000 Pittsburg
Cities with 100,000 to 500,000 Rochester
Cities with 25,000 to 100,000 Auburn
Smaller places Oswego
Capitals with less than 25,000 DOVER
National Capitals
State Capitals
Other Cities
80° Longitude West 78° from Greenwich 76° 74°
46° 44° 42° 40°
QUEBEC
CANADA
ONTARIO
DOMINION
GEORGIAN BAY
Ottawa R.
Ottawa
Ottawa River
Montreal
Richelieu R.
St. Lawrence
Prescott
Ogdensburg
Malone
Lake Champlain
Plattsburg
St. Albans
Burlington
Kingston
THOUSAND ISLANDS
Watertown
ADIRONDACK MTS.
Mt. Marcy
Ferrisburg
Middlebury
Ticonderoga
Lake George
Brandon
Castleton
Barrie
Lake Simcoe
Toronto
Stratford
Hamilton
Brantford
LAKE ONTARIO
LAKE ERIE
Niagara Falls
N. Tonawanda
Tonawanda
WELLAND CANAL
Niagara R.
Buffalo
Lackawanna
Lockport
Albion
ERIE CANAL
Batavia
Rochester
Newark
Genesee R.
Canandaigua
Seneca Falls
Geneva
Seneca L.
Keuka Lake
Cayuga L.
Auburn
Syracuse
Oswego
Fulton
Solvay
Oneida Lake
Oneida
Rome
Utica
Herkimer
Ilion
Little Falls
Mohawk R.
Black R.
Gloversville
Johnstown
Amsterdam
Saratoga Springs
Glens Falls
Hudson Falls
Cohoes
Hudson
Hoosick Falls
Bennington
Schenectady
Watervliet
Troy
Albany
Rensselaer
N. Adams
Pittsfield
TACONIC MTS.
BERKSHIRE HILLS
Cortland
Ithaca
Norwich
Oneonta
Susquehanna R.
CATSKILL MTS.
Catskill
Hudson
NEW YORK
Dunkirk
Fredonia
Chautauqua Lake
Jamestown
Salamanca
Olean
Hornell
Corning
Elmira
Owego
Binghamton
Erie
Corry
Warren
Bradford
Allegheny R.
French Creek
Meadville
Kingston
Poughkeepsie
Hudson River
Housatonic R.
MASS.
VERMONT
CONN.
Matteawan
Newburgh
Middletown
Port Jervis
Peekskill
Haverstraw
Ossining
White Plains
Yonkers
New Haven
Bridgeport
Danbury
Stamford
Long Id. Sound
LONG ISLAND
Westchester
New Rochelle
Mt. Vernon
Bayonne
New York Bay
STATEN ISLAND
Blossburg
Emporium
Oil City
Sharon
S. Sharon
Youngstown
Newcastle
Dubois
Williamsport
West Branch of Susquehanna
Clearfield
PENNSYLVANIA
Butler
Beaver Falls
Ohio R.
OHIO
McKees Rocks
Carnegie
Homestead
Duquesne
Pittsburg
Braddock
McKeesport
Greensburg
Washington
Monessen
Wheeling
Connellsville
Uniontown
Altoona
Johnstown
ALLEGHENY MTS.
APPALACHIAN MTS.
Juniata R.
Sunbury
Mt. Carmel
Shamokin
Shenandoah
Mahanoy City
Pottsville
Carbondale
Dunmore
Scranton
Old Forge
Pittston
Plymouth
Wilkes-Barre
Nanticoke
Hazleton
Delaware R.
Easton
Bethlehem
Allentown
S. Bethlehem
Phillipsburg
Lebanon
Harrisburg
Carlisle
Steelton
Reading
Pottstown
Schuylkill R.
Norristown
Lancaster
Phoenixville
Columbia
York
Chambersburg
Gettysburg
Coatesville
W. Chester
Chester
PHILADELPHIA
Camden
Wilmington
Susquehanna River
Dover
Paterson
Passaic
Hoboken
Jersey City
E. Orange
Newark
Elizabeth
Perth Amboy
New Brunswick
NEW JERSEY
Red Bank
Long Branch
Asbury Park
Trenton
Lakewood
Barnegat
Hammonton
Bridgeton
Millville
Atlantic City
ATLANTIC OCEAN
Cape May
Delaware Bay
DEL.
DOVER
MARYLAND
Cumberland
Baltimore
Chesapeake Bay
ANNAPOLIS
Potomac R.
DISTRICT OF COLUMBIA
Washington
WEST VIRGINIA
Monongahela R.
Grafton
Clarksburg
Buckhannon
VIRGINIA
Williams Engraving Co., N. Y.

FIG. 26.

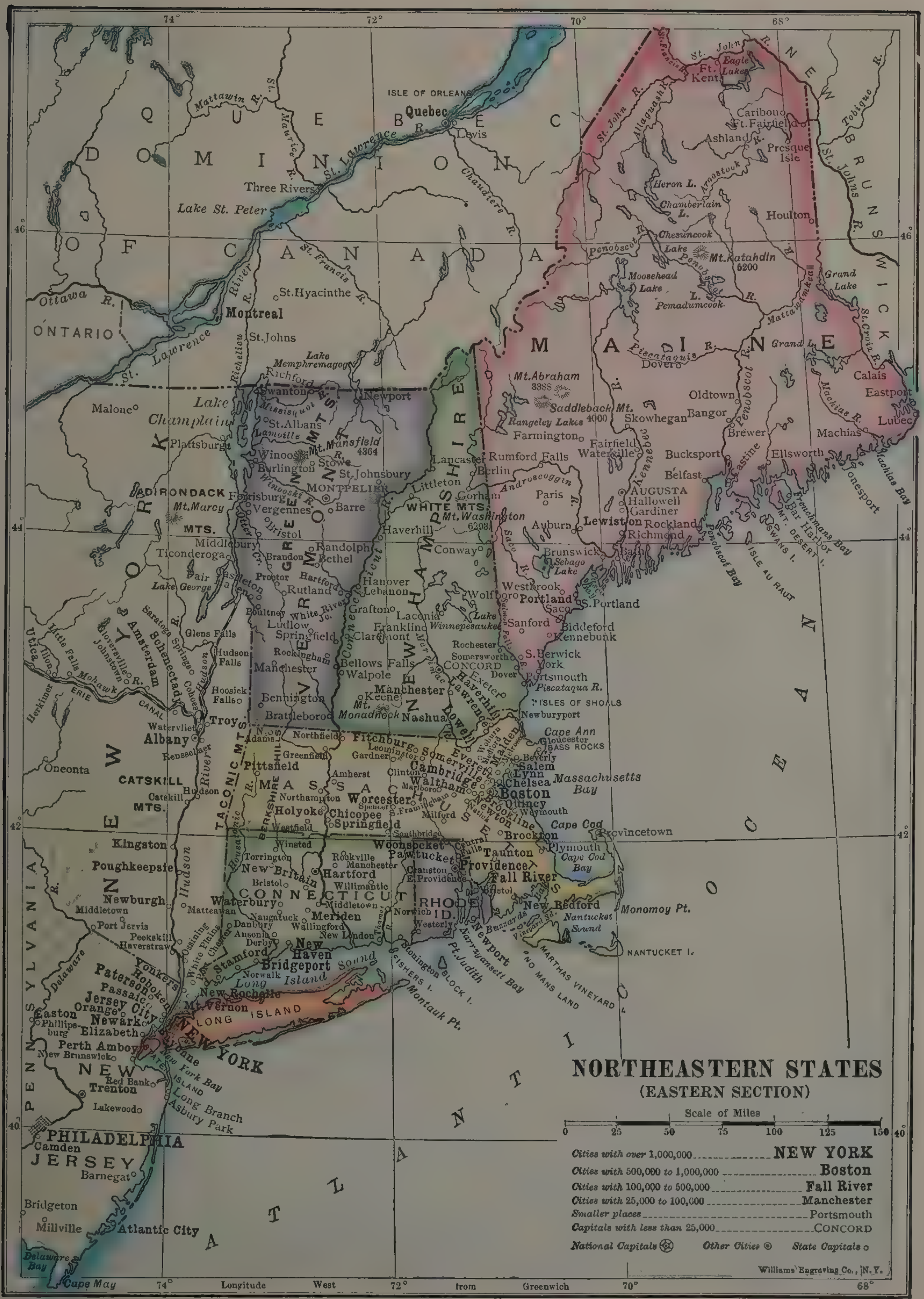
NORTHEASTERN STATES
(EASTERN SECTION)
Scale of Miles
0
25
50
75
100
125
150
Cities with over 1,000,000 NEW YORK
Cities with 500,000 to 1,000,000 Boston
Cities with 100,000 to 500,000 Fall River
Cities with 25,000 to 100,000 Manchester
Smaller places Portsmouth
Capitals with less than 25,000 CONCORD
National Capitals
Other Cities
State Capitals
Williams Engraving Co., N.Y.
Longitude
West
from
Greenwich
74°
72°
70°
68°
46°
44°
42°
40°
DOMINION OF CANADA
QUEBEC
ONTARIO
Quebec
Levis
Isle of Orleans
St. Lawrence R.
Three Rivers
Lake St. Peter
Montreal
St. Hyacinthe
St. Johns
Ottawa R.
Mattawin R.
St. Maurice R.
Chaudiere R.
St. Francis R.
Richelieu River
Lake Memphremagog
NEW BRUNSWICK
St. John R.
St. Francis R.
Ft. Kent
Eagle Lake
Tobique R.
MAINE
Caribou
Ft. Fairfield
Ashland
Presque Isle
Houlton
Allaguash R.
Aroostook R.
Heron L.
Chamberlain L.
Chesuncook Lake
Mt. Katahdin 5200
Penobscot R.
Moosehead Lake
Pemadumcook L.
Mattawamkeag R.
Grand Lake
Grand L.
St. Croix R.
Calais
Eastport
Lubec
Machias R.
Machias
Jonesport
Machias Bay
Piscataquis R.
Dover
Mt. Abraham 3388
Saddleback Mt. 4000
Rangeley Lakes
Farmington
Skowhegan
Oldtown
Bangor
Brewer
Fairfield
Waterville
Bucksport
Belfast
Ellsworth
Castine
Frenchmans Bay
Bar Harbor
Mt. Desert I.
Swans I.
Isle au Haut
Penobscot Bay
AUGUSTA
Hallowell
Gardiner
Kennebec R.
Androscoggin R.
Rumford Falls
Paris
Auburn
Lewiston
Rockland
Richmond
Bath
Brunswick
Sebago Lake
Westbrook
Portland
S. Portland
Saco
Biddeford
Kennebunk
Sanford
Saco R.
S. Berwick
York
NEW HAMPSHIRE
Lancaster
Berlin
Gorham
Littleton
WHITE MTS.
Mt. Washington 6293
Haverhill
Conway
Hanover
Lebanon
Wolfboro
Grafton
Laconia
Lake Winnepesaukee
Franklin
Claremont
Rochester
Somersworth
CONCORD
Dover
Portsmouth
Piscataqua R.
Exeter
Bellows Falls
Walpole
Manchester
Keene
Mt. Monadnock
Nashua
Merrimac R.
Isles of Shoals
Connecticut R.
VERMONT
GREEN MTS.
Richford
Swanton
Newport
St. Albans
Lamoille R.
Missisquoi R.
Mt. Mansfield 4364
Winooski
Burlington
Stowe
St. Johnsbury
MONTPELIER
Barre
Vergennes
Bristol
Middlebury
Randolph
Bethel
Brandon
Proctor
Rutland
Hartford
White River Jc.
Poultney
Ludlow
Springfield
Rockingham
Manchester
Bennington
Brattleboro
Lake Champlain
NEW YORK
Malone
Plattsburg
ADIRONDACK MTS.
Mt. Marcy
Ticonderoga
Lake George
Glens Falls
Hudson Falls
Saratoga Springs
Schenectady
Amsterdam
Gloversville
Johnstown
Little Falls
Ilion
Utica
Herkimer
Mohawk R.
Erie Canal
Cohoes
Hoosick Falls
Troy
Watervliet
Albany
Rensselaer
Oneonta
CATSKILL MTS.
Catskill
Hudson
Hudson River
Kingston
Poughkeepsie
Newburgh
Middletown
Matteawan
Port Jervis
Peekskill
Haverstraw
Ossining
White Plains
Yonkers
Mt. Vernon
New Rochelle
LONG ISLAND
Long Island Sound
Montauk Pt.
Fishers I.
Block I.
NEW YORK
New York Bay
Staten Island
MASSACHUSETTS
TACONIC MTS.
BERKSHIRE HILLS
N. Adams
Northfield
Greenfield
Pittsfield
Amherst
Northampton
Holyoke
Chicopee
Westfield
Springfield
Fitchburg
Leominster
Gardner
Clinton
Marlboro
Worcester
Spencer
Framingham
Milford
Southbridge
Lowell
Lawrence
Haverhill
Newburyport
Cape Ann
Gloucester
Bass Rocks
Beverly
Salem
Lynn
Malden
Everett
Somerville
Cambridge
Waltham
Chelsea
Boston
Brookline
Newton
Quincy
Weymouth
Natick
Massachusetts Bay
Cape Cod
Provincetown
Brockton
Plymouth
Cape Cod Bay
Taunton
Fall River
New Bedford
Buzzards Bay
Vineyard Sd.
Nantucket Sound
Monomoy Pt.
Nantucket I.
Marthas Vineyard
No Mans Land
RHODE ID.
Woonsocket
Central Falls
Pawtucket
Providence
Cranston
E. Providence
Bristol
Newport
Narragansett Bay
Westerly
Pt. Judith
CONNECTICUT
Housatonic R.
Winsted
Torrington
New Britain
Rockville
Manchester
Hartford
Bristol
Willimantic
Middletown
Waterbury
Naugatuck
Meriden
Wallingford
Danbury
Ansonia
Derby
New Haven
New London
Norwich
Thames R.
Stonington
Stamford
Norwalk
Bridgeport
PENNSYLVANIA
Delaware R.
NEW JERSEY
Paterson
Passaic
Hoboken
Jersey City
Orange
Newark
Elizabeth
Easton
Phillipsburg
Perth Amboy
New Brunswick
Red Bank
Long Branch
Asbury Park
Trenton
Lakewood
PHILADELPHIA
Camden
Barnegat
Bridgeton
Millville
Atlantic City
Delaware Bay
Cape May
ATLANTIC OCEAN

FIG. 26.

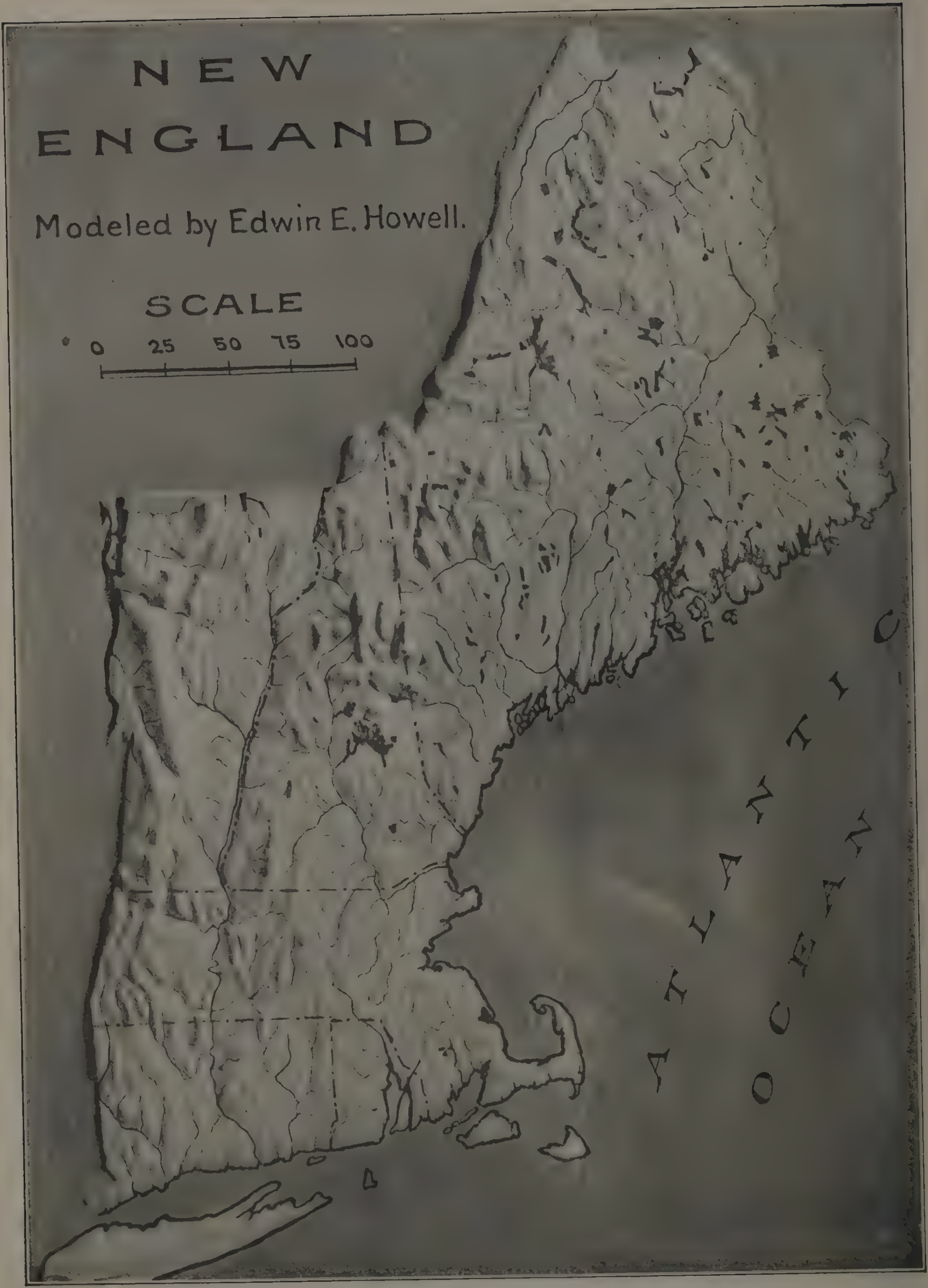

FIG. 27. — The New England States.

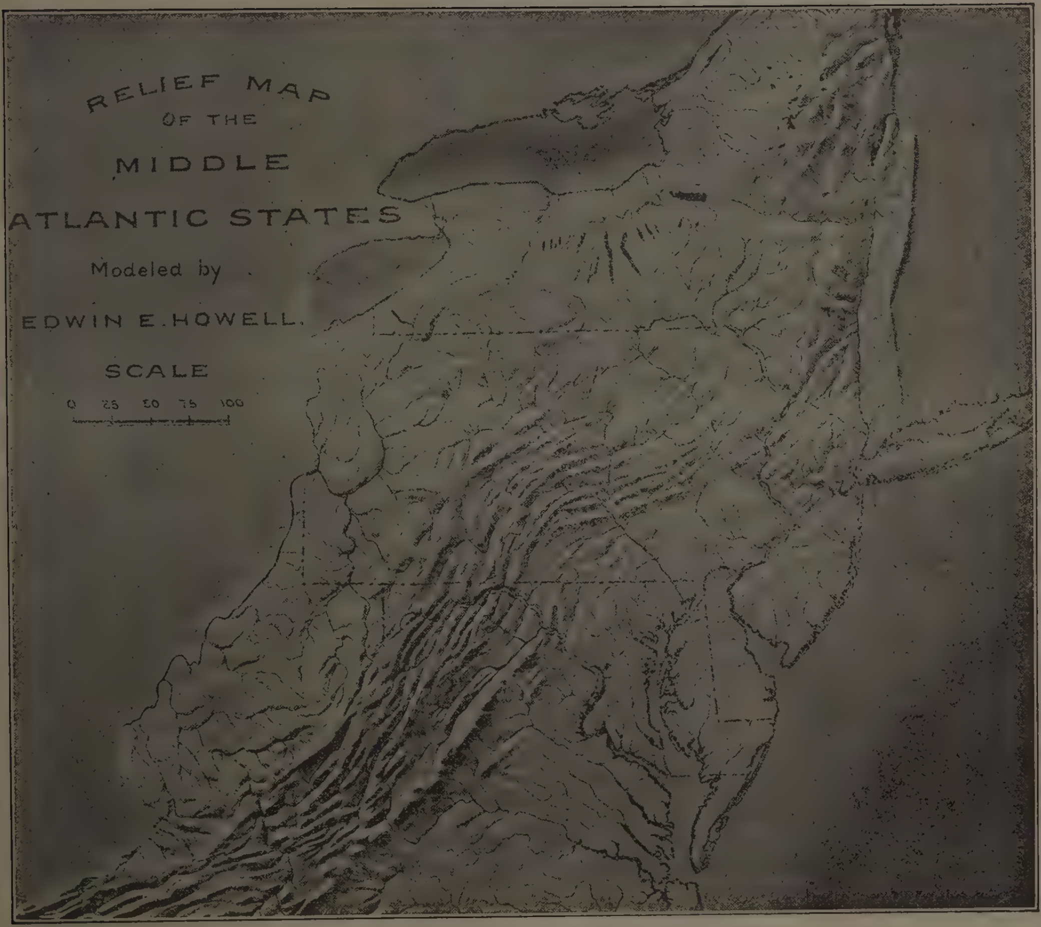

FIG. 28. — Relief map of Middle Atlantic States.

The area of these states

Of the nine states in this group, the six farthest northeast are called New England. See Figure 26; also Figure 27. By examining Figure 23 you can see what a small part of our whole country these nine states make. How do they compare with Texas in area? Other states are often compared with Pennsylvania in size. Compare its area with that of Massachusetts.

Character of their surface

A large part of the surface of these states is hilly or mountainous. Near the coast the hills are low, and much of New Jersey is a plain; but the land rises gradually toward the interior until the mountains are reached. West of the mountains, in New York and Pennsylvania, the country is a low, hilly plateau with some plains, especially along the shores of lakes Erie and Ontario.

Fig. 29. — A view of the White Mountains of New Hampshire.

The mountains have different names. In Pennsylvania are the Appalachian Mountains which extend southward into the Southern States. North of the Appalachian mountains are the Catskill and Adirondack mountains in New York. Find the Green Mountains and the White Mountains in New England. Mount Washington in the White Mountains is the highest peak in all these states, being a little over a mile high.

In this hilly and mountainous land there are many lakes, as you can see by the map; and many waterfalls, the largest being Niagara Falls, the grandest waterfall in the world. Much of the surface is very rough and rocky, with bold cliffs and the soil strewn with stones.

Character of the coast, with reason

The coast of this entire section is very irregular, with many capes, peninsulas, bays, sounds, and harbors. This irregularity of coast line is due to the fact that the land has been lowered, and the ocean has entered the valleys, forming bays and harbors, while the higher parts have remained above the sea as capes and peninsulas. This sinking of the land has therefore been very important, for it has made safe places where ships can load and unload. It has made possible such large and busy seaports as Boston, New York, and Philadelphia.

The northern part of the Northeastern States has a bold, rocky coast, with much grand scenery. But the coast of New Jersey is low and sandy, with fine sand beaches, where the bathing is excellent.

The climate

1. In the North

Northern Maine lies so far north that it has a severe climate; but it is made even more severe by the influence of a cold ocean current which flows along the northern coast.

This is called the Labrador current, because it flows past the Labrador coast. It is a slowly moving stream of ocean water, many miles wide, that begins in the Arctic Ocean and flows southward along the coast of Nova Scotia and New England as far as Cape Cod.

On the other hand, there is a current of warm water that makes the southern portion of New England warmer than it would be otherwise. This current, called the Gulf Stream, comes from the Gulf of Mexico and flows northeast, out into the Atlantic Ocean. East of New England it is much farther from land than the Labrador current.

The prevailing winds blow from the west; but every few days the direction of the wind changes to the east or south, and the air then comes from the ocean, often bringing rain. The winds that blow from the east and northeast are cool in summer and very chilly in winter, because they are cooled in passing over the Labrador current. They often cause heavy snows in winter, and rain and fog in summer. Those winds that blow from the south, on the other hand, are warmed in passing over the Gulf Stream. Largely for that reason, the southern part of New England is much warmer than the northern part, and has little snow in winter.

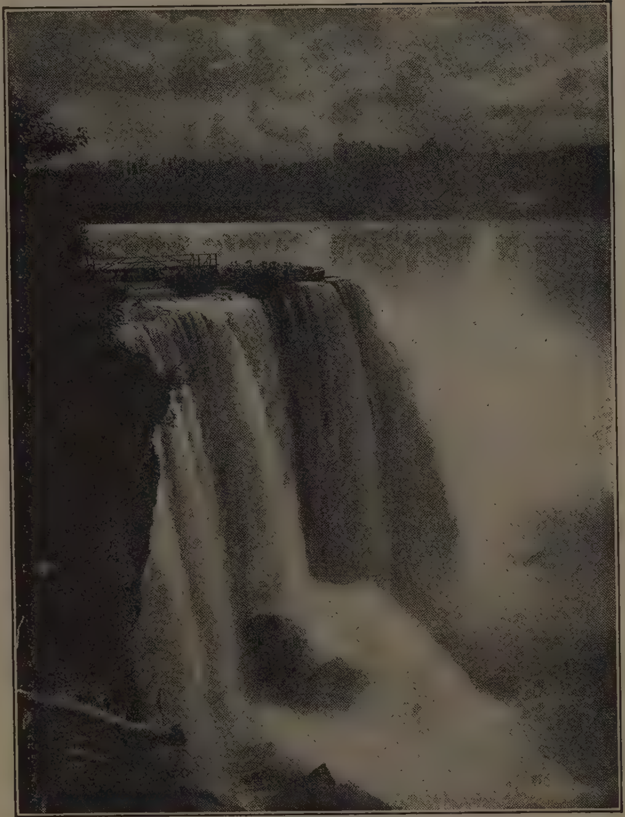

FIG. 30. — A view of Niagara Falls.

2. In the South

The climate of most of New York and Pennsylvania is much like that of New England; but the New Jersey coast has a much warmer climate, for here the effect of the warm Gulf Stream is felt. For this reason Atlantic City, for instance, has such mild weather that many people go there to escape the cold of winter and early spring.

Population of these states

In spite of their small area and rugged surface, the Northeastern States contain nearly twenty-six million inhabitants, or more than one fourth of the people in the United States. One of them, New York, has more inhabitants than any other state in the Union. It contains also the largest city in the New World. Pennsylvania is next to New York in population and in size.

Why so great a population

It is interesting to learn why so many people have crowded together in this small section. What special kinds of work can have attracted them here?

Photograph supplied by Pennsylvania Railroad.

Fig. 31. — Bathing on Cape May Beach, N.J.

Agriculture

1. Importance of this industry

So much of New England is hilly or mountainous, and the soil is so strewn with boulders, that farming is not so extensive an industry there as in many other parts of the country. In some places, where the soil is very poor, and no market is near, farming has proven such a failure that many farms have been abandoned. On these, the orchards are grown up with weeds, and the houses and barns are tumbling down. This is especially true in the more hilly parts of New England.

On the other hand, there are some sections in New England where there is really excellent farm land. This is true in the larger valleys, particularly the Connecticut Valley, which has much level and fertile land.

In New York, Pennsylvania, and New Jersey it is natural that agriculture should be important. The soil in the broad river valleys, in the level land bordering on the lakes, and in many of the valleys of the highlands, is fertile and well drained; and the growing season is long, with plenty of rain and sunshine. A variety of crops is always raised.

2. Products from the farms

(1) *Poultry raising and truck farming*

Nearly every farmer keeps some poultry, often selling some chickens and eggs; and some make a business of *raising poultry,* such as hens, turkeys and ducks. Some of the duck farms raise as many as 5000 ducks per year.

A very common occupation is *truck farming.* On these farms, various kinds of vegetables, such as tomatoes, sweet corn, potatoes, cucumbers, cabbages, and celery, are carefully cultivated; and these, together with milk and eggs, are sent to the nearest town to be sold. The farmer often takes them from house to house, thus securing higher prices than if he sold them to a storekeeper. Why?

There is a great number of these farms in the neighborhood of the large cities, and there is, almost always, a good market for their products. The large houses and barns and well furnished homes prove the latter fact.

(2) *Dairying*

Where the farms are so far away from the cities that it is impossible to drive to market, *dairying* is common (Fig. 32). So much milk is needed in the large cities that special arrangements are made for marketing it. Special cars, and even whole trains, carrying nothing but cans of milk, are run daily from far out in the country to the city. Much milk is made into butter and cheese, sometimes on the farm, but much more commonly at the *creameries,* where the work is done by machinery.

While butter and cheese are made in all the states, this work is especially important in New York. Utica, on the Mohawk River, is a prominent cheese market.

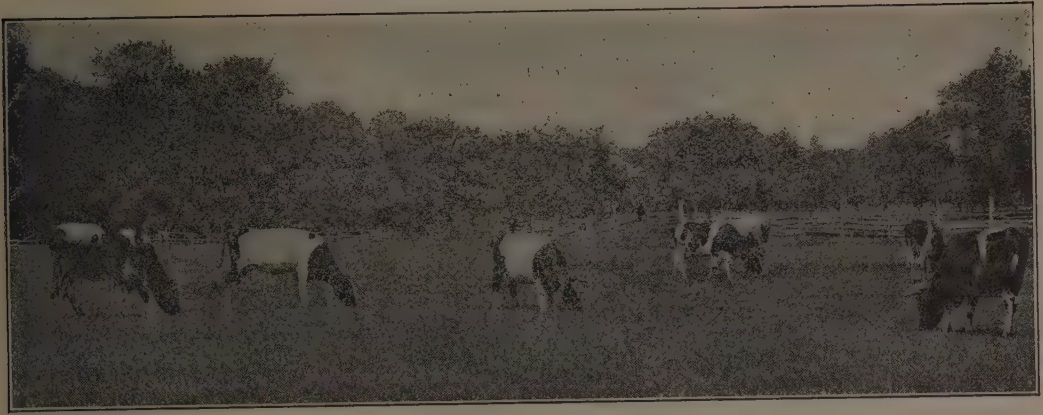

FIG. 32. — A herd of dairy cows grazing in the pasture. Their milk is sent to the cities.

Both the soil and climate of these states are well suited to the raising of fruit and vegetables. Nearly every farmer produces some of each. The sections near large bodies of water have the best climate for fruit. This is because the water cools the air in autumn and warms it in winter, thus decreasing the danger from frosts.

(3) *Fruit and vegetables*

One of the most noted sections for fruits is along the southern shores of Lake Erie, in western New York. Here grapes are extensively cultivated (Fig. 33). Apples are another important fruit crop in New York, being grown in many parts of the state, but especially along the southern shores of Lake Ontario. There is so much fruit raising in New York that the *nursery business*, or, that of raising young fruit trees, vines, and bushes to sell, is a flourishing industry. One of the principal centers of this business is ROCHESTER. Peaches, strawberries, and grapes are very abundantly raised in New Jersey.

Besides the cattle necessary for dairying, many horses are raised in these states. In some of the more hilly sections, like Vermont, western New York, and Pennsylvania, there are many sheep. Hogs are raised on many farms.

(4) *Other products.*

Tobacco is grown extensively in the Connecticut Valley. Other important crops are hay and the grains, such as wheat, oats, corn, barley, rye, and buckwheat. Far more land is used for these crops than for the others already mentioned. However, since the states farther west are even more noted for hay and grain, a description of this kind of farming will be given in connection with those states.

In spite of the extensive farming in these states, not enough food is produced in them to feed the dense population living there. Wheat, meat, sugar, and other materials must be shipped to them, many of these things being grown in the states farther west and south.

In the days of the early settlers, most of

FIG. 33. — Grapes on a vine in a vineyard in western New York.

Lumbering

1. Extent of the forests

this region was covered with forests, and one of the first products sent back to England was lumber. Now the woods have been cleared away from much of the land, but where it is too steep or rocky for farming, large forests still remain.

For instance, there are large tracts of land in northern Maine, New Hampshire, and Vermont, as well as in parts of the three states south of them that are still covered with timber. Standing on the summit of Mount Katahdin, one sees only a vast wilderness of trees in all directions. The nearest cultivated land is twenty-five miles to the east, while the unbroken forest stretches much farther away to the north and west. The Adirondack Mountains, and the Appalachian Mountains in New York and Pennsylvania, are also heavily wooded.

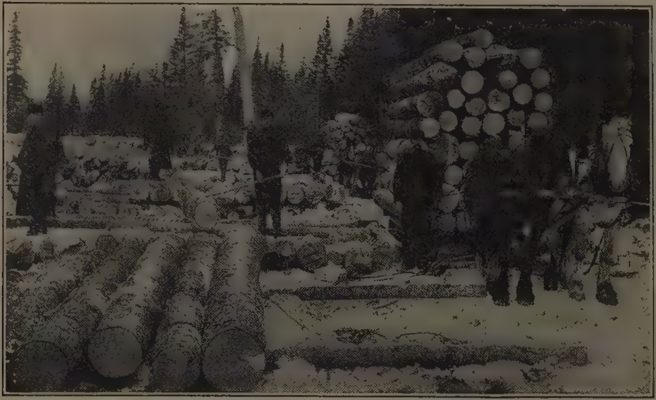

Fig. 34. — Lumbermen at work in winter, drawing the logs on sleds to the edge of the stream.

2. Cutting the timber

Winter is the busiest season for cutting timber in these forests, for the swamps, which are numerous, are then frozen over. At that season, also, the snows have covered the bowlders and fallen trees, and have made the surface level enough for sleds, loaded with logs, to be drawn through the woods.

The industry of lumbering is very important, although it does not employ many men. Usually fifty men or more are necessary to a logging camp. With axes in hand, they go through the woods chopping down all the trees that are large and sound enough for good lumber. The limbs are then chopped off, and the logs are dragged by horses to the banks of the nearest stream (Fig. 34).

3. Floating the logs to the mills

When the snow melts in the spring, the cutting is over and another busy season begins. The ice on the rivers breaks up, the streams are swollen by the melting snows, and the logs are whirled off downstream in the swift current. Frequently, however, even this flood of water is not sufficient to carry them. In such cases, in order to provide more water, dams are placed across the streams, or at the outlet of lakes. When more water is needed, the dams are opened, and a flood is poured into the stream. In this way immense numbers of logs are floated or "driven" downstream, forming what the lumbermen call a "log drive."

The work of driving the logs is a very exciting one. The logs often run on to rocks and shoals; and, as soon as one log gets caught, others are held back by it. If the "jam" is not speedily removed, the entire stream may become blocked. Such a condition is called a *log jam* (Fig. 35). It is the business of the log drivers to prevent jams by freeing the logs that become thus lodged.

Some of the logs are stopped near waterfalls, far upstream, where they are sawed into boards, laths, shingles, etc.; but most of them are carried to sawmills as far down the river as the current will take them.

The forests of these states supply much

lumber, though far less than formerly.

4. Value of the forest

Make a list of articles manufactured out of wood. Forests have another important use: they prevent the rain water from running rapidly off from the land. Where forests have been carelessly destroyed by the lumbermen, or by fire, the streams rise rapidly after every rain, and then quickly decrease in size. Often there is not enough water to run the factories that use the water power.

For these reasons there are *forest reservations* in several of these states, in which it is forbidden to cut down the trees, or where only a few of the largest are cut each year. Besides this, some large tracts of woodland, called *game preserves,* are carefully protected by certain citizens, for the sake of the fishing and hunting at the proper season. State laws also protect the game.

Fishing

1. Former abundance of fish

When the country was first settled, a great abundance of fish, especially mackerel, halibut, and cod, was found close to the shore. Such names as Cape Cod, Halibut Point, and Bass Rocks, given the places on the New England coast, indicate this. Can you locate these places?

One of the chief foods of the early settlers was fish, and the fishing industry soon became important. It was the fishing that early attracted the French to the American coast.

2. Centers of the fishing industry

Fish are now much less abundant near the coast, but hundreds of vessels and thousands of men are engaged solely in catching them. Gloucester, which is a center of that industry, is the most noted fishing port in the United States; but Boston, Portland, and Provincetown also have an important fish trade. Locate each.

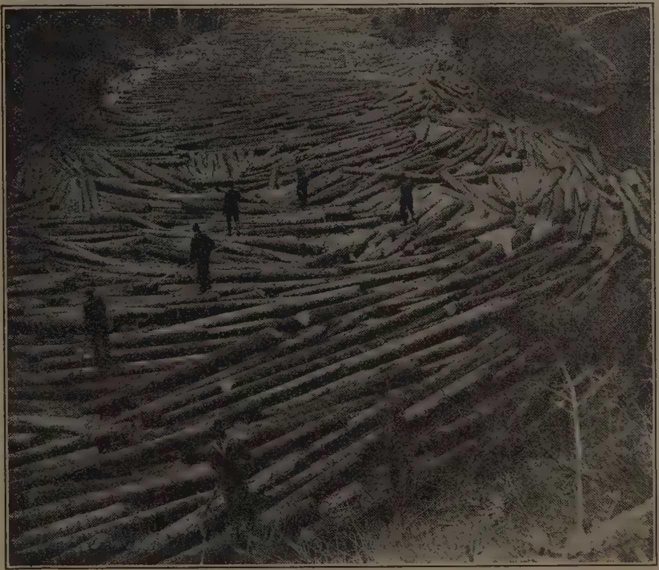

Fig. 35. — A log jam in a stream in which the logs are being floated from the forest. The lumbermen are at work trying to start the logs moving again.

Most of the mackerel are caught in spring and summer. They swim together, on the surface of the ocean, in such numbers, or *schools,* as fishermen say, that they may be easily seen from a distance.

3. Mackerel

The fishermen who cruise about in search of the mackerel, sail in swift, two-masted vessels, called *schooners* (Fig. 36). When they see a "school," they spring into their great seine boats, row over to the fish, drop a large net, or *seine,* into the water, and draw it around the "school." Then the seine is drawn in, forming a pocket and trapping the fish. In this pocket enough fish are sometimes caught to fill hundreds of barrels. Some of the fish are taken to port to be sold fresh, but most are salted. This method of fishing is similar to that which the Disciples of Jesus used in the Sea of Galilee.

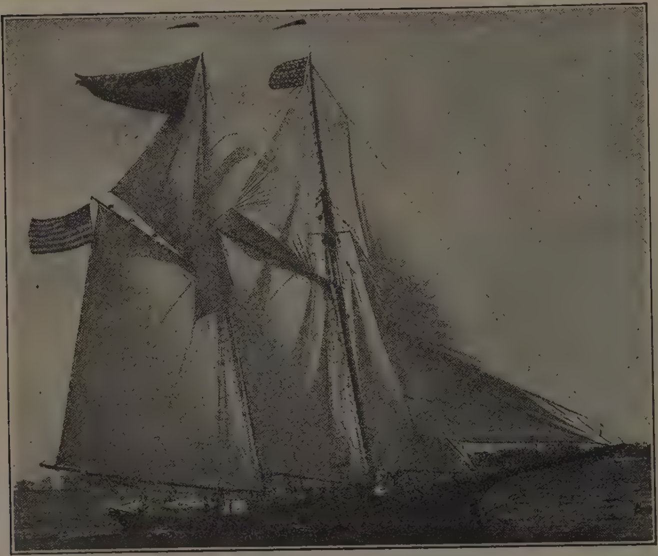

Fig. 36. — A Gloucester fishing schooner, just leaving port on a fishing trip.

4. Halibut and codfish

(1) *Where caught*

Halibut and cod cannot be caught with a seine, for instead of swimming at the surface, these fish live in deep sea water. They are caught in winter as well as in summer, mainly on the Fishing Banks that lie off the coasts of New England and Newfoundland. Some of the Gloucester fishing vessels, however, go as far as Greenland and Iceland for halibut and codfish.

(2) *Method of catching*

Halibut are very large, some weighing more than a man, and they are often caught upon single lines. Codfish may be caught in the same manner, though a *trawl* (Fig. 37) is more commonly used for cod than for halibut. The trawl consists of a number of hooks hanging from a single long line, all lowered into the water together and left there for hours. The fish swallow the bait on the hooks, and in this way many are caught at one time.

5. Other ocean foods

Lobster fishing also is carried on, especially on the coast of Maine. A lobster trap, made of wood and weighted with stone, is lowered to the

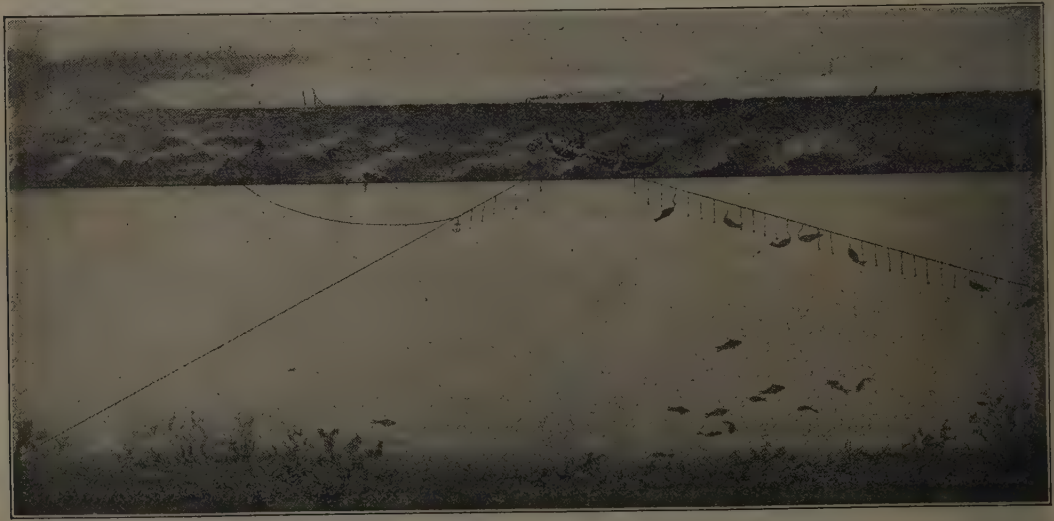

Fig. 37. — Fishermen drawing up a trawl on the Fishing Banks of Newfoundland. The long line, with shorter ones hanging from it, with hooks on their ends, is lowered to the bottom. After a while it is drawn up and the fish that are on the hooks are taken into the boat.

bottom of the sea, where the lobster lives, crawling around among the rocks and seaweed. A fish-head for bait is inside the trap, and the lobster crawls in to get it; but he is so stupid that he is rarely able to find his way out.

Clams are found along many parts of the New England coast. Some of them live buried in the mud flats which are exposed to view at low tide. At such times boys and men dig these shellfish out, much as a farmer digs potatoes. Another kind of shellfish on the New England coast is the *scallop;* and still another is the *oyster*, which thrives in the shallow water of the bays south of Cape Cod.

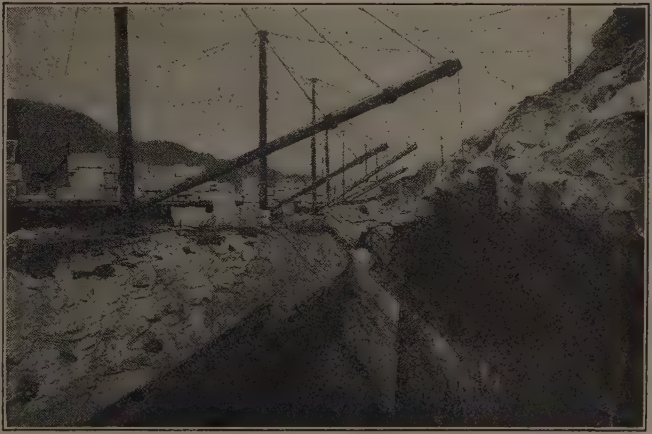

Fig. 38. — One of the marble quarries near Rutland, Vt. The stone is quarried out in the deep pit on the right, and the blocks are hoisted to the surface by the derricks.

Among the building stones in these states there are several kinds of great value.

Quarrying and mining

1. Stones and clay

One of the oldest granite quarries in the country is at Quincy, near Boston. Other granite quarries are found at Barre, Vt., Concord, N.H., and at several points along the Maine coast. Much of the granite is used for paving stones in the city streets where heavy wagons pass. It is used also for buildings and monuments.

The most noted marble quarries in the United States are near Rutland, Vt., where much of the stone is white, though some of it is streaked with blue. In other places in Vermont the colors of the marble are quite different, and often very beautiful. Marble is too soft for paving stones, but it is much used for buildings, statues, and monuments.

Limestone, valued for the manufacture of lime and Portland cement, and clay, of excellent quality for making bricks, sewer pipes, and flower pots, are found in many places. Slate and sandstone are abundant.

Fig. 39. — The salt in these great piles was brought to the surface in brine that rose through wells bored down to the salt beds of central New York.

Salt is a mineral which is necessary to every one. In the early days, salt springs were discovered at the point where Syracuse now stands. That city owed its early growth to those springs, although little salt is now produced there.

2. Salt

Beds of salt were deposited in the sea, which covered this region before the Coal Period. They were later buried beneath layers of rocks, much as the coal beds were buried. In the region south of Syracuse and Rochester, the salt beds lie deep in the earth, and from them salt is obtained either by boring down to the beds, pumping the brine, and evaporating it by heat until the salt is left; or by sinking a *shaft* and mining it much as coal is mined. New York produces more salt than any other state except Michigan. Ohio and Kansas also produce large quantities.

Two fuels, oil and natural gas, are found in western New York and Pennsylvania.

3. Petroleum and natural gas

Petroleum, as the oil is generally called, means "rock oil," — a name which suggests its origin.

(1) How formed

The oil and gas have been formed by the decay of remains of animals and plants that lived ages ago when the ocean covered this region. As they died and fell to the bottom of the sea they were buried beneath sand and clay which have now become hard rock. The oil and gas, which came from the decay of the animals and plants, entered the crevices between the grains of the sandstones and other rocks. Thus these substances were stored deep down in the earth. Oil resembling petroleum is now manufactured from fish; and gas similar to that now found in the rocks often rises from swampy places, where plants are decaying.

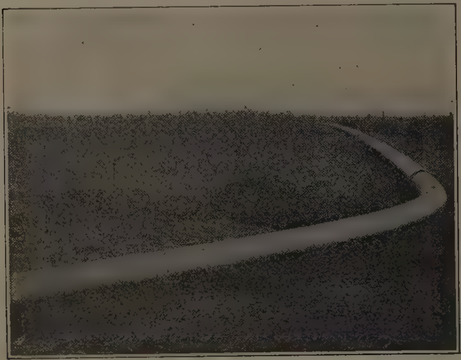

Fig. 40. — A large pipe through which petroleum is flowing from the oil wells to the refinery.

(2) How obtained from underground

When a hole is bored down to a rock layer where gas is thus stored, the gas rushes to the surface. It is then led away in pipes, often to distant places. Thousands of homes in Buffalo, Pittsburgh, and other cities are heated with natural gas; and in many factories, too, the gas is used for fuel.

Borings in which petroleum rises are called *oil wells.* From these the oil sometimes spurts, or gushes out; but it must often be pumped out. Near the oil wells cities have grown up, such as Bradford and Oil City in Pennsylvania, and Olean in New York.

(3) Products from the oil

After being taken from the earth, the petroleum is stored in large tanks, and then refined. In its natural state it is a thick, dark yellow or reddish fluid, but in the refinery it is changed so that a large part of it becomes clear, colorless *kerosene oil.*

Benzine, naphtha, and gasoline also are made from petroleum. The thick substances that are left, after the refining, are used in making dyes of various kinds, machine oil, vaseline, and paraffin. The latter is used in many ways; for example, in making chewing gum and candles.

The pioneers knew nothing about either of these substances. For lighting in the early days they used either candles or lamps in which some animal oil, such as whale oil, was burned. Very likely, even your great-grandfather, when he was a boy, did not know what kerosene oil was.

4. Coal

Another fuel, far more important than either of these, is coal, which is found in great abundance in Pennsylvania.

(1) How coal has been formed

There is good proof that the coal used in our stoves and furnaces has been made from plants. Roots of plants may still be seen in the old soil, now changed to rock, that lies beneath the coal beds; and stems of plants, and even trunks of trees changed to coal are found in the coal beds. Besides, with a microscope, or at times even with the naked eye, one can see that coal is made of bits of plants pressed closely together. Sometimes the full form of a fern or leaf, called a *fossil*, may be seen.

The plants of which the coal is made grew many ages ago in great swamps. When they died, they fell into water, making thick beds of plant remains, like those that are forming in swamps to-day. If it could then have been dug up and dried, it would have made good fuel. Indeed, in Ireland, Norway, and other cool, moist lands, it is now the custom to dig such woody matter out of the swamps and dry it for burning. Such fuel, called *peat*, is much used for cooking and heating in those countries.

(2) *The kinds of coal*

These ancient swamps were later covered up by layers of sand, clay, and other substances, now hardened into rock. The plant remains themselves have also been changed by pressure until they have become a kind of rock, or mineral coal. Some of the poorer coals, known as *lignite*, are little more than peat beds partly changed to coal.

Other beds, having had far more pressure upon them, have been changed to harder coal. One of them is called soft, or *bituminous*, coal. Another, called *anthracite*, has had even greater pressure. It has been so greatly changed that it is as hard as some rocks, and is known as *hard coal*.

(3) *The amount and kinds of coal in Pennsylvania*

About half the coal of the United States comes from Pennsylvania. This state produces both kinds of coal, being one of the very few regions in the world where anthracite is found in abundance. WILKESBARRE and SCRANTON, in eastern Pennsylvania, owe their importance largely to the anthracite mined near them. Great quantities of soft, or bituminous, coal are mined about PITTSBURGH. Pennsylvania is the only one of the Northeastern States that has important coal fields.

(4) *Method of mining*

In some places the coal is found close to the surface, while in many others it is several hundred feet beneath the surface. Where the coal lies far down in the earth, deep *shafts* must be sunk to reach it. From the sides of such a shaft, *tunnels* (Fig. 41) are dug into the coal beds, and from these the coal is removed. Some of the coal beds are only two or three feet thick, but others are several times as thick as this.

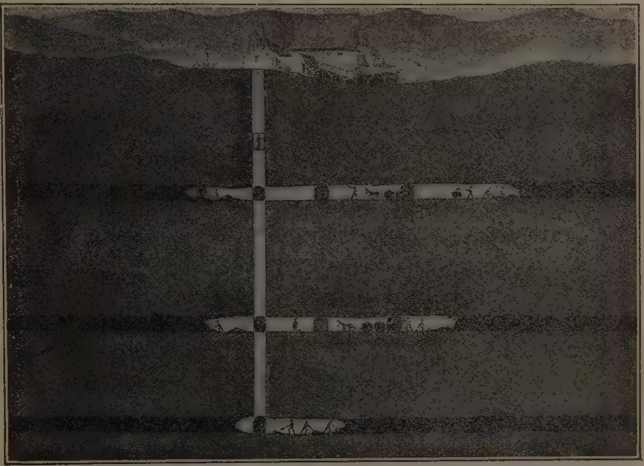
FIG. 41. — A drawing to illustrate how coal is mined. There is a shaft going straight down, then tunnels extend off from it into the different coal beds.

Usually there are several beds of coal, with thick layers of rock between, and the shaft extends downward through them all, with tunnels reaching out into each bed (Fig. 41). In a large mine one may travel through miles and miles of tunnels. Since it is very dark so far underground, the tunnels are sometimes lighted by electricity; but the workmen often furnish their own light by means of lamps fastened to their caps.

(5) *Uses of coal*

Both the hard and the soft coal are used not only for heating houses and for cooking, but also in making steam to use in running locomotives, steamboats, and the machinery of factories. Much coal is used also in smelting iron and other metals, and in the manufacture of gas for lighting. Coal is, indeed, the most useful of all minerals. Without it our country could not have such prosperity.

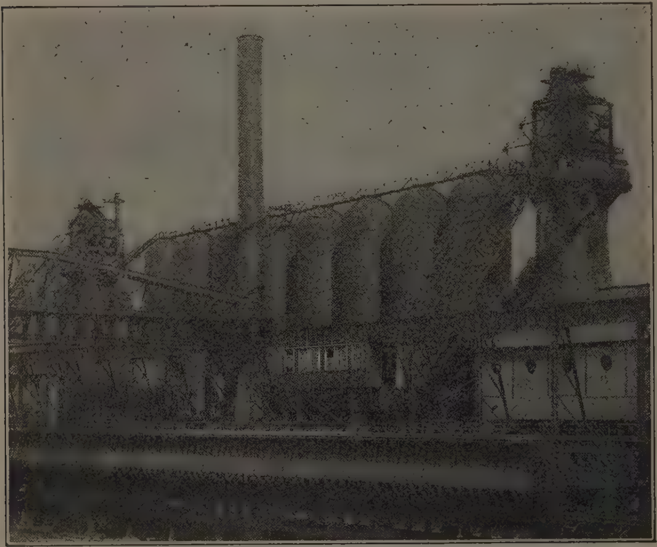

FIG. 42. — A blast furnace in which iron ore is changed to iron.

5. Iron ore

(1) *Where found, and why important*

The large iron industries that have developed in the Northeastern States are due to the great quantities of iron ore which is mined in Pennsylvania, New York, and New Jersey. Large iron industries developed here. In recent years the local supply of iron ore has not been sufficient and so iron ore has been shipped from Michigan and other states.

(2) *Its appearance*

In appearance, iron ore is sometimes a hard, black mineral; sometimes a soft, loose, yellowish, or reddish brown earth. It is not *iron* at all, any more than *wheat* is flour; it is only *iron ore*, a mineral out of which, by much work, iron may be made.

Manufacturing

1. Its importance

Manufacturing is more extensively developed in the Northeastern States than in any other part of our country. That is one of the principal causes of so many and so large cities in this section, for large factories necessarily bring together great numbers of people.

Not only can the coal from Pennsylvania easily be shipped to all points, to produce steam and electricity, but water power is abundant in many sections. Niagara Falls (Fig. 30), the greatest waterfall on the continent, furnishes water power for extensive manufacturing in Buffalo and elsewhere. Smaller waterfalls are common throughout most of these states, and on that account manufacturing has been greatly favored from the start.

2. Manufacture of iron goods

These advantages, together with so much iron ore, have made the manufacture of iron, and iron goods, one of the leading industries in the Northeastern States.

(1) *How iron is made*

Making iron from iron ore is called *smelting*. In smelting, the ore is mixed with limestone, and also with coke, which is made out of soft coal and produces great heat when burning. The three substances are all dumped together into a high, tower-like structure, called a *blast furnace* (Fig. 42). It is so named because a blast of air is forced through it, to produce a strong draft while the coke is burning. The great heat melts the ore and limestone; then the iron, being heaviest, sinks to the bottom of the fiery hot liquid. The limestone, united with those parts of the ore that are not iron, rises to the surface, forming worthless slag, which is drawn off through an opening in the furnace. Through a lower opening, the heavy iron is run off into trenches, made of sand, on a sand floor.

When the molten iron cools, the little bars of iron are called pig iron.

(2) *The kinds of iron made*

Some iron goods, such as stoves and the iron parts of your desk, are nothing more than this pig iron melted and cast, in molds, into the shape that is desired. This is *cast iron,* which is so brittle that it easily breaks under a heavy blow. Other materials, such as knife blades, boiler plates, rails for railways, and watch springs are made of *steel.* This also is made of pig iron, though not until it has been melted again and greatly hardened and strengthened by an expensive process. *Wrought iron,* a third kind, is used where it is necessary for the metal to be tough and at the same time to bend easily, as in iron wire.

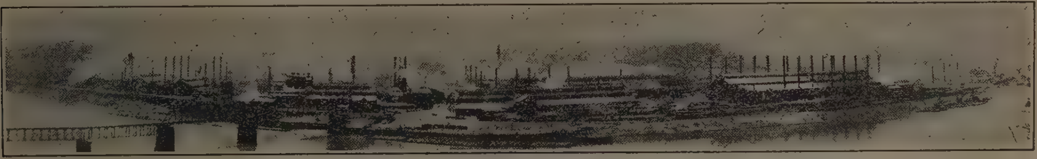

Fig. 43. — Homestead Steel Works, one of the many iron and steel manufactories in and near Pittsburgh.

(3) *Centers for iron manufacturing*

Almost every large city in the Northeastern States is to some extent engaged in iron work of one kind or another. Some make iron and steel out of the ore, others manufacture articles out of the iron and steel. For example, in the state of New York, Buffalo manufactures car wheels, machinery, and many other articles. It has several thousand factories, many of them making iron goods. In New York City, iron and steel products of almost all kinds are made. Iron and steel goods, such as bicycles and machinery, are manufactured in Syracuse; stoves are made in Albany and Troy; and there are iron foundries in Binghamton, Elmira, and Schenectady.

In Pennsylvania, Philadelphia manufactures steel ships, cars, and hundreds of other iron products; Pittsburgh, to which Allegheny is now united, makes steel and iron goods of nearly every kind (Fig. 43); and Scranton, Reading, Harrisburg, Erie, Altoona, and a score of other places, have furnaces, foundries, and machine shops for iron manufacturing. In New Jersey, Jersey City, Newark, Camden, and Hoboken manufacture iron goods.

3. Manufacture of glass, pottery, brick, and cement

(1) *Glass*

Manufactories making four other articles from mineral products are especially worthy of note in these states. One of these articles is *glass,* which is made at and near Pittsburgh, where natural gas furnishes cheap fuel. Pittsburgh is the greatest center in the country for the manufacture of plate glass.

(2) *Pottery and bricks*

Clay suited to the manufacture of *pottery* is found in a number of places; but much clay for pottery is imported. A high grade of pottery is made at Trenton, N.J., where this industry has become very important.

So many *bricks* are used for building, that brickyards are found in the neighborhood of nearly all cities. Bricks are made of clay. This is first pressed into the brick shape when damp, then dried, and finally baked. In this process some of the grains melt, so that when cooled again, they cling together like stone. The clays near PHILADELPHIA, and the great clay beds of the Hudson Valley, above NEW YORK CITY, supply an abundance of brick for these and neighboring cities.

(3) *Cement*

Portland *cement* has become of great importance within the last few years. It is made in many places, especially in New Jersey, Pennsylvania, and New York. To make it, limestone is ground fine and mixed with coal dust. The two are then placed in a furnace, where the burning coal dust gives out so much heat that the limestone melts. It comes out of the furnace as a kind of clinker, which is then ground into fine powder. This cement has the valuable property of becoming hard like rock, or *setting*, when water is added. It is used for sidewalks, for buildings, dams, bridges, and many other purposes, taking the place of wood, stone, and iron.

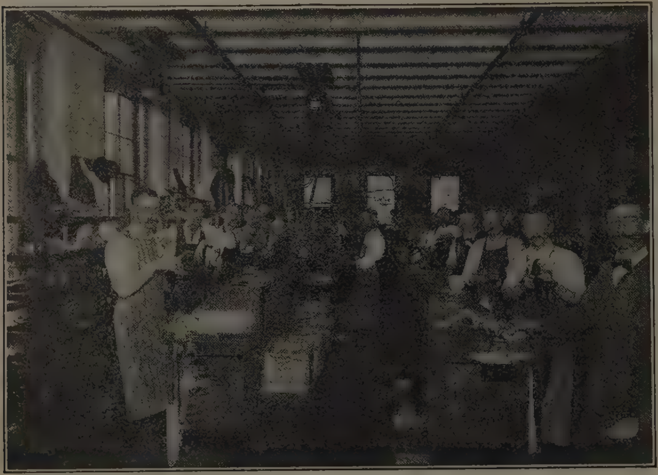

FIG. 44. — Workmen in a shoe factory in Lynn.

4. Textile manufacturing

There are about 400 cotton mills in New England alone, making such articles as sheets, towels, stockings, underwear, thread, string, handkerchiefs, and gingham and calico dress goods. As many as 1200 persons may be employed in a single mill, perhaps three quarters of the number being women. One of these mills may use from 60,000 to 70,000 pounds of cotton per day.

(1) *Extent and variety of cotton and woolen manufacturing*

The manufacture of woolen goods is another very important industry in New England.

(2) *Chief cities engaged in textile manufacture*

The following cities are engaged extensively in the manufacture of either cotton or woolen cloth, or both; in Maine, BIDDEFORD, LEWISTON, AUBURN, and AUGUSTA; in New Hampshire, MANCHESTER, NASHUA, and DOVER; in Massachusetts, LOWELL and LAWRENCE on the Merrimac River; PITTSFIELD in western Massachusetts, and FALL RIVER, NEW BEDFORD, and TAUNTON in the southern part; in Rhode Island, PAWTUCKET, WOONSOCKET, and PROVIDENCE which is the second city in size in New England. One of the largest cotton factories in the world is at MANCHESTER, N.H.

In New York, New Jersey, and Pennsylvania there is also much manufacture of cotton and woolen goods. For instance, YONKERS in New York is noted for its manufacture of carpets and hats; NEW YORK CITY and PHILADELPHIA for clothing; PHILADELPHIA for carpets; TROY for collars and cuffs; UTICA for cotton goods; and JAMESTOWN for plush goods. Locate each of these cities on the map.

5. Leather manufacturing

(1) *Cities engaged in it, and articles made*

Boot and shoe making is carried on in a number of cities, though the most important are LYNN, HAVERHILL, and BROCKTON in Massachusetts, and BINGHAMTON and ROCHESTER in New York. Locate these cities. Besides boots and shoes, leather is made into many other articles, such as bookbindings, harnesses, pocketbooks, and bicycle saddles. Can you name articles made of leather?

Leather is made from the hides of animals, *(2) How leather is prepared*

including cattle, sheep, goats, horses, and hogs. After the hair is removed, the hides are taken to *tanneries*, where they are soaked in tannic acid to make them wear well.

(3) How boots and shoes are made

After being tanned, the leather is taken to the shoe factories (Fig. 44) and cut up, one machine cutting out soles of a certain size, a second tops, a third tongues, etc.; these parts are then sewed or nailed together, and the shoes are soon finished. As in the case of cotton and woolen manufacturing, nearly all the work is done by machinery, each person caring for one or more machines, and performing the same simple task day after day.

6. Metal manufacturing

On account of the water power, the New England people early began to manufacture metals into various articles. Although steam now largely takes the place of water power, these industries are still very extensive, especially in Massachusetts, Rhode Island, and Connecticut.

(1) Kind of articles made, with reason

Since almost no coal and iron are produced in New England, these two materials must be shipped from other states. Therefore, large, heavy objects, that require much metal and coal, are not generally made. The lighter articles, like jewelry, clocks, needles, cutlery, tools, and firearms, that require a high degree of skill, are the chief articles manufactured from metal in New England.

(2) Cities engaged in this industry

WORCESTER, west of Boston, is noted for the manufacture of wire and iron goods, besides envelopes, boots, and shoes. Great quantities of jewelry are made at PROVIDENCE. NEW HAVEN is noted for hardware and firearms. Carriages, sewing machines, etc., are manufactured at BRIDGEPORT. Firearms, cars, and bicycles are made at SPRINGFIELD and at HARTFORD, which is situated at the head of steamboat navigation on the Connecticut River. FITCHBURG is also engaged in metal manufacturing.

Near Boston, at WALTHAM, the American Watch Company has an immense factory (Fig. 45), where 3100 watches are made every day. About 4300 persons, more than half of whom are women, are employed there, receiving about $200,000 a month in wages. Great numbers of clocks and watches are made in WATERBURY, and jewelry and cutlery at MERIDEN, Conn. In hundreds of smaller cities, towns, and villages in New England there are factories and mills of various sorts. Some of the cities where cotton and woolen goods are manufactured, such as FALL RIVER, LOWELL, and NEW

FIG. 45. — The Waltham Watch Factory at night. This is but one of the many large factories of New England.

BEDFORD, are also noted for the manufacture of iron and other metals.

7. Manufactures from the forests

Every city in these states is engaged in the manufacture of lumber, or of other materials for building, or for furniture.

(1) *Chief centers for such manufactures*

BANGOR in Maine is especially noted for its manufacture of lumber. Logs from the forest are easily floated down the Penobscot River to Bangor; and here they are cut up into lumber, which ocean vessels carry to other points. The same is true of PORTLAND. On the wharves of this city are quantities of boards ready to be shipped away, to be made into boxes, barrels, doors, and hundreds of other articles. WATERVILLE, AUGUSTA, and BATH, in Maine; WILLIAMSPORT, Penn., and WATERTOWN, N.Y., are engaged extensively in manufacturing articles of wood.

(2) *Paper*

Another important use of the forests is in making paper, for much of the paper commonly seen, such as newspaper and wrapping paper, is now made of wood.

Short logs, after having the bark removed, are placed in a steel frame and forced against an enormous grindstone. The *wood pulp* thus ground off is carried away by water, run through a sieve, deposited on a wide belt, and pressed into thin sheets between rollers. When dry, it is paper. Wood pulp is made also by the use of chemicals. We do not often think, when reading the news or wrapping a package, that the paper in our hands may once have been part of a live tree, perhaps in the woods of Maine.

Paper mills are found in many cities. However, HOLYOKE, the greatest paper-making city in New England, is situated not in the forest region, but in the midst of busy cities in Massachusetts. There the pulp is generally made of rags, which produce a finer grade of paper than wood. The neighboring cities furnish the necessary rags.

(3) *Tannic acid; maple sugar and sirup*

The forest trees supply other valuable products besides lumber and wood pulp. One of these is *tannic acid*, used in tanning leather; it is made from the bark of the hemlock and other trees. Another product is maple sirup and maple sugar. Among the trees in the forests of these states is the *sugar maple*. Its sap, unlike that of most trees, is sweet; and if a hole is bored through the bark in early spring, when the sap is moving rapidly through the tree, it will ooze forth as a watery liquid. This is then boiled to drive off some of the water, thus making maple sirup and maple sugar.

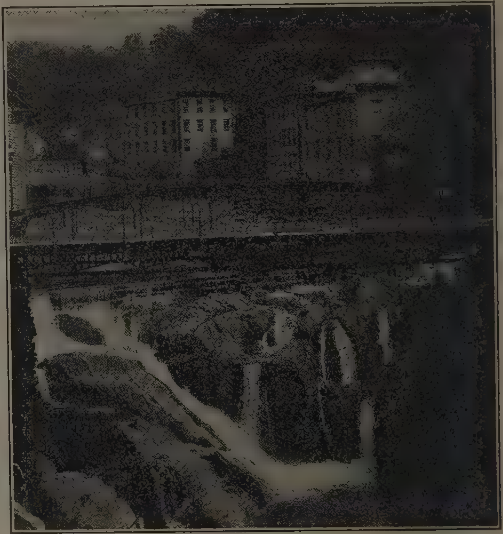

FIG. 46. — Factories in a New England village, which have been built because of the water power there.

8. Other kinds of manufacturing

Although these are the principal kinds of manufacturing carried on in the Northeastern States, there are many others that have not been mentioned. For instance, automobiles, farm machinery, wagons, rubber goods, silk goods, chocolate, and many other articles are manufactured in large quantities in these states. One very important industry is grinding grain into flour, which is done in scores of places. ROCHESTER, N.Y., for example, has many flour mills, as well as other factories, run by the water power furnished by the falls of the Genesee River.

Commerce

1. Why especially important in these states

All this manufacturing calls for great quantities of food, and for an immense amount of raw materials, such as coal, metal, cotton, wool, leather, and lumber. The wants of the twenty-six million inhabitants of the Northeastern States naturally cause extensive trade in such materials and the articles made from them. It is plain, then, that the transportation of goods, as well as buying and selling, must be very important occupations in these states. In addition, there are many millions of persons living west of these states who have goods that they wish to send across the Atlantic Ocean to foreign lands; and the foreign countries, in turn, have goods to send to us. A large portion of this trade is carried on in the seaports of the Northeastern States.

FIG. 47. — Delaware Water Gap.

This *foreign commerce* alone keeps thousands of men and women busy all the time, mainly in the large cities on the coast, such as New York, Philadelphia, and Boston.

2. Harbors

One thing that makes such commerce possible is the excellent harbors. Locate the three bays here; that is, New York Bay, Delaware Bay, and Massachusetts Bay. One of the most noted harbors of all is the first, at the mouth of the Hudson River. The others are also very important and there are many smaller ones of much value.

3. Connections with the interior

(1) *By water*

Good harbors are of little use unless they can be easily reached from the interior. New York Bay is especially favored in this respect, for it is connected by water with the very heart of the fertile country of the west. This waterway leads first northward up the Hudson River, where the ocean tide rises as far as TROY, just above Albany. Thus, good-sized boats can go as far as that point.

From near Albany, westward, the *Erie Canal* (Fig. 53) has been dug for a distance of 350 miles, connecting the Hudson River with Lake Erie at BUFFALO. The Erie Canal is not nearly so valuable at present as it was at the first, though it is now being deepened to make it more useful. When this work is completed the canal will float large barges.

(2) *By rail*

The canal follows the route formerly taken by the Indians, which is the easiest route from the Eastern States to the central part of the country. From Buffalo, lake boats are

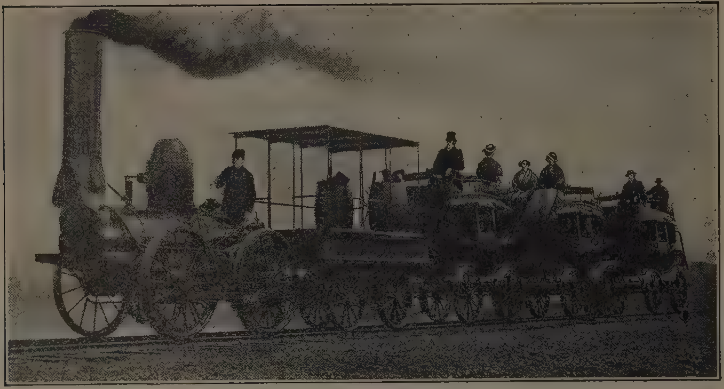

FIG. 48. — The first railway train which ran out of Albany.

able to go to Cleveland, Detroit, Chicago, Duluth, and other ports on the Great Lakes. Thus, by river, canal, and lake, New York Harbor is connected by water with a productive, thickly settled country, extending westward for more than a thousand miles. This is one of the most extensive and useful interior waterways in the world.

Large vessels can ascend the Delaware as far as Philadelphia, but in New England the rivers are of small value for shipping inland, because of their rapids and falls.

(2) *By rail*

When the first canals were built in this country, there were no railroads. Shortly after the Erie Canal was completed, it was found that steam engines could be used to haul freight by rail; also, that they could carry it much faster than it could be carried by water. Railroads, for both freight and passengers, then began to be built very rapidly.

One of the first and most important railways was built in New York State (Fig. 54). This line, now called the New York Central, extends from New York City along the Hudson River to ALBANY, where it connects with a branch that runs to Boston. From Albany westward to Buffalo, the route is almost parallel to the Erie Canal. Trunk line railroads connect the port of New York with every section of the country, one of them entering the city through a tunnel under the Hudson River. Great trunk lines also connect Boston and Philadelphia with the West and the South.

FIG. 49. — The Empire State Express, one of the trains of the present day on the New York Central Railroad. This picture was taken while the train was running at a speed of 90 miles an hour.

Great centers of population

1. New York City and vicinity

(1) *Population near New York Harbor*

The greatest of all the cities of the United States is NEW YORK, which contains nearly five million inhabitants, and is second only to London among the great cities of the world. There are several other large cities near by, the largest being NEWARK, JERSEY CITY, PATERSON, ELIZABETH, and HOBOKEN (Fig. 54), all west of the Hudson River in New Jersey. Although in another state, these cities are so closely related to New York in

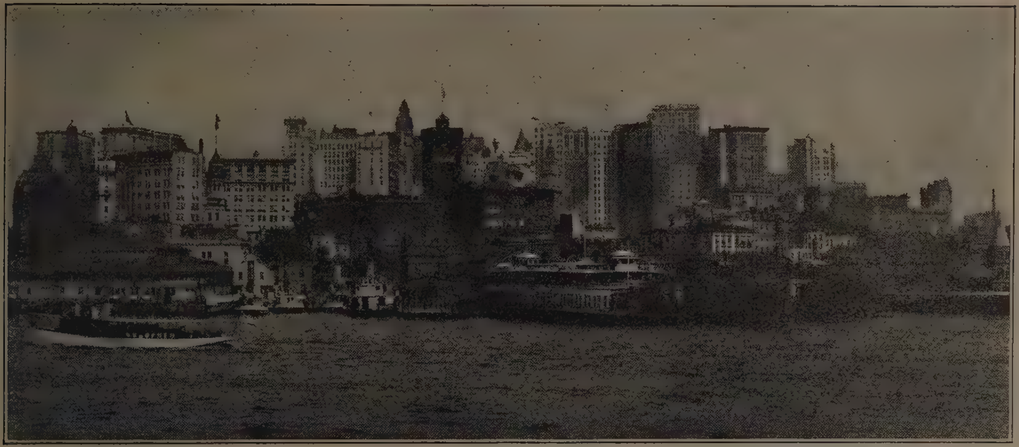

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Fig. 50. — The high buildings, or skyscrapers, on the end of Manhattan Island.

business that they may almost be considered a part of New York City; so also may YONKERS, on the Hudson, just above that city. Before it became a part of New York, the city of BROOKLYN, on Long Island, was itself fourth among the cities of the country. More than six million persons, or one fifteenth of all the inhabitants of the United States, live within twenty miles of New York Harbor.

(2) *Reasons for this vast population*

It is, *first of all,* the great convenience for shipping that has caused so great a number of people to collect at this point. Not only can goods easily be sent far inland by water and by rail, as already explained, but they can also be carried on the ocean to any port in the world. The harbor is deep enough for the largest vessels, and large enough to hold all that come. More than half of all the foreign trade of the United States is carried on through this port, which is the leading shipping point in the New World.

The *second* reason for the vast population here is the fact that this is the greatest manufacturing center in the New World.

Nearly every manufactured article that men need is made in or near New York, but one of the chief industries is the manufacture of clothing. Cotton and woolen goods are sent here from the factories of New England, and other sections, to be made into such articles as women's gowns, men's suits, and underclothing. Large buildings, in which hundreds of men and women are employed, are given up to this work alone.

Iron and coal are so near that the manufacture of iron goods is another great industry. The refining of petroleum is a third, the oil being led, in pipes, from the oil fields of western Pennsylvania to refineries in New Jersey, near New York. The refining of sugar is another immense business in New York, Jersey City, and Brooklyn; and silk manufacture is carried on extensively at PATERSON.

Merchants from all parts of the United States come to New York to buy goods. The business of selling goods to merchants, to be sold again, called the *wholesale trade,* is a *third* reason why so many people have collected around New York Harbor. A large section in the southern part of the city is given up almost entirely to the wholesale trade. Since the land is very expensive, as much use as possible is made of every bit of it. For that reason the buildings are high

(Fig. 51). Many of the stores and office buildings are twenty or thirty, and some fifty stories high. Goods manufactured in the city, together with others brought from all parts of the world, are collected in this part of New York. These are sold in quantities, or by wholesale, to retail merchants both of New York and of other cities and towns, who then sell them to customers in their own stores.

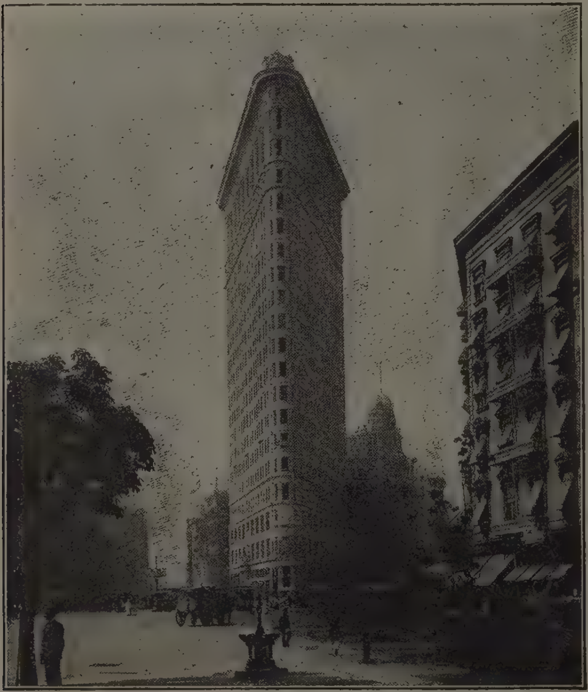

FIG. 51.—The Flatiron building, built with this shape because it occupies the corner where two streets come together. Stores or offices occupy every floor in this tall building.

(3) *Life in the great city*

The difference between life in New York City and upon a farm (p. 85) is striking. On some of the streets in the city scarcely anything but stores can be seen for ten or twelve miles. Many of these stores are small, but some occupy enormous buildings, and employ many hundreds of clerks.

Families whose homes are in the city do not usually occupy a whole house, but often hundreds of people live in one building. These structures, called *apartment houses*, are usually from six to eight stories high, and some even from fifteen to twenty. They are so arranged that one family occupies only a small part of one floor, called an *apartment*. Other families live above and below, as well as on each side, being separated by only a few inches of brick or boards. Since land is so valuable there is usually neither front yard nor back yard.

In the poorer sections of the city the people are even more densely crowded. Some of the children have never seen the country, and they have seen scarcely any birds, trees, or grass, except possibly in one of the city parks. In these crowded sections there are many foreigners from all nations of the earth.

To escape such a crowded city life, hundreds of thousands of men live in suburban towns, or country homes, from ten to forty miles from their places of business. Every day they spend from one to three hours traveling back and forth. Some ride upon *elevated railways* built in the street, and supported by iron columns. Others go by train in one of the *subways*, which extend for miles underground, and even cross under the rivers to Brooklyn, Jersey City, and Hoboken.

How different all this is from the country, where perhaps only two or three houses may be seen at a time! Where sunlight and fresh air may enter one's home from all sides of the building! Where there is plenty of room to play, and where there are green grass, large trees, and singing birds in the yard! No wonder the people living in great cities are anxious to visit the country, the mountains, the lakes, and the seashore during the summer season.

2. Buffalo and cities along the Erie Canal

Most of the other large cities in the State of New York are found along the water and rail routes from New York City to Lake Erie (Fig. 52). The most important of these is BUFFALO on Lake Erie, at the western end of the Erie Canal. Before the canal was built, Buffalo was only a village. But both New York and Buffalo have had a very rapid growth since 1825, when the canal was finished. Name other cities along the Erie Canal route (Fig. 52), and recall what has been said about them.

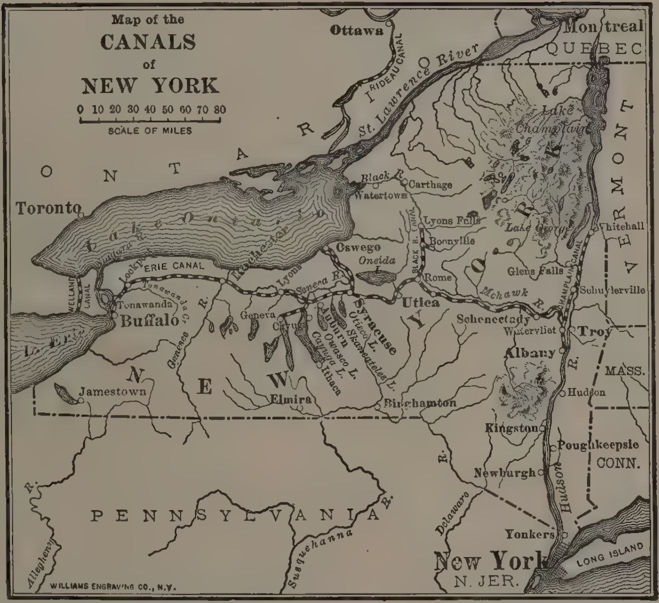

FIG. 52. — The Erie Canal and other water routes of New York and vicinity.

Buffalo is a great railway center, as well as an important lake port. Here quantities of grain, flour, lumber, and iron, brought by lake vessels from the West, are transferred to railway cars or to canal boats; and coal and manufactured goods are shipped westward. There is also much manufacturing of many kinds.

Niagara Falls (Fig. 30), which are about twenty miles from Buffalo, supply electric power for use in lighting the city and in running street cars and factories. Much use is made of this electric power near the Falls, as at the city of NIAGARA FALLS, which has become an important manufacturing center. Power from Niagara is used also for running electric cars between Buffalo and Niagara Falls and between Buffalo and Lockport. This electric power is carried by wire even as far east as Syracuse. How far is that?

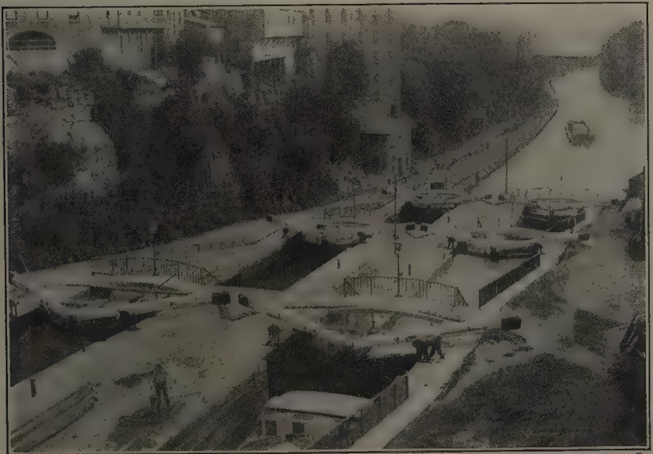

FIG. 53. — Locks in the Erie Canal. The canal boats are drawn into one of these spaces, which is then filled with water, raising the boat to a higher level. This is then repeated until the boat is raised to the level of the canal above the locks. Or, if a boat is going the other way, it is lowered in the locks by letting the water run out.

3. Philadelphia and neighboring cities

The greatest of all the cities southwest of New York is PHILADELPHIA (Fig. 54), which has over 1,500,000

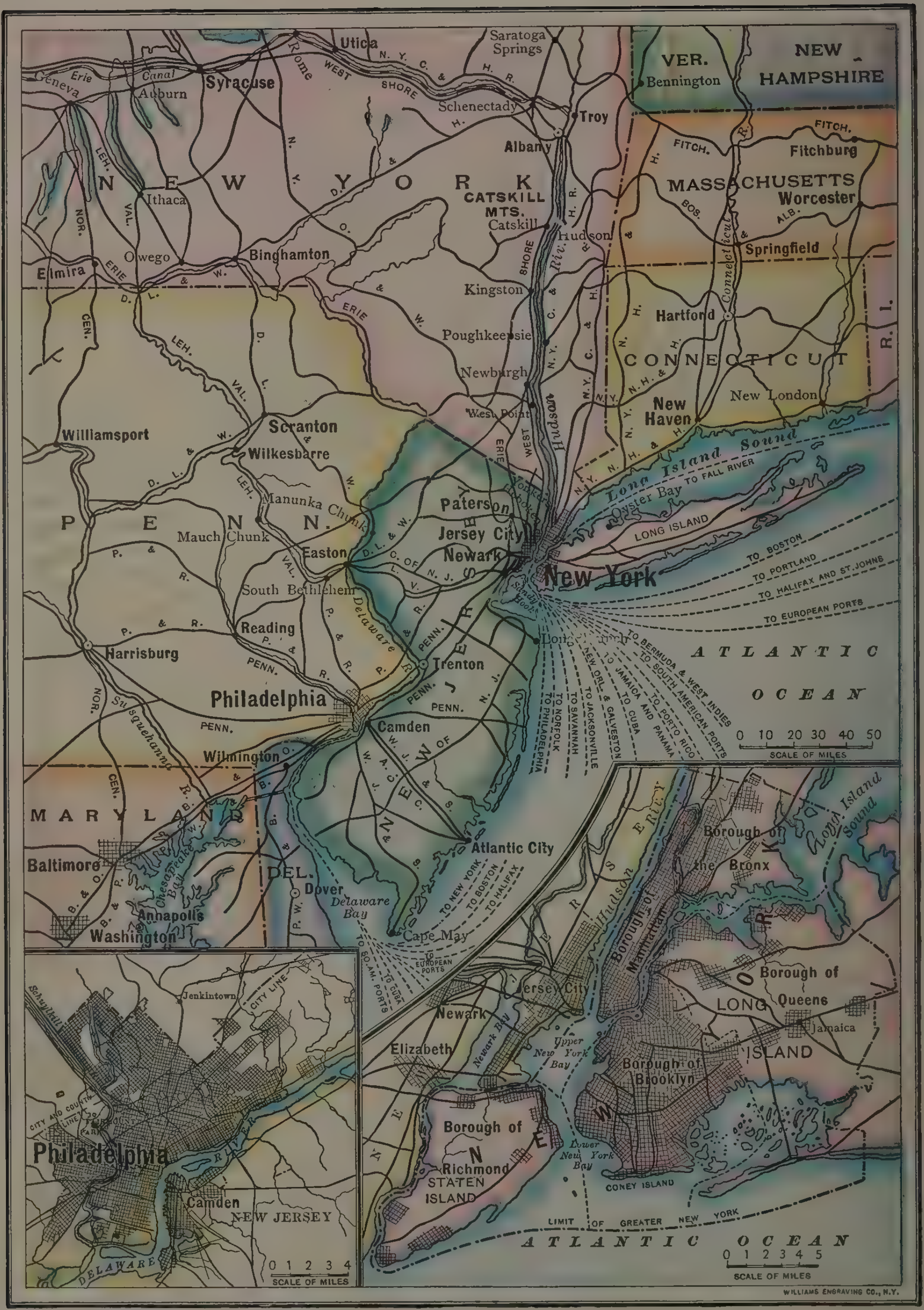

FIG. 54.
Map to show the location of New York City, Philadelphia, and Baltimore.

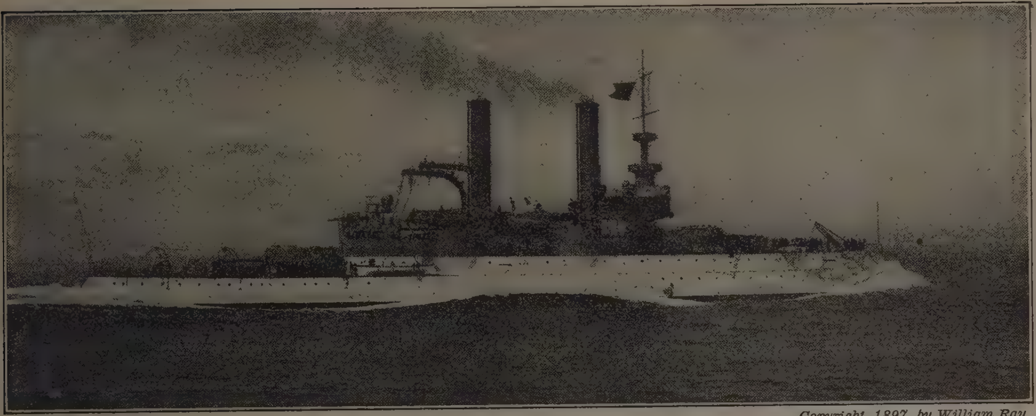

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FIG. 55. — The Battleship *Iowa* going at full speed. This was built in the shipyards below Philadelphia.

inhabitants, and ranks third among the cities of the United States. As in the case of New York, other important cities are near by, the largest being TRENTON and CAMDEN, in New Jersey; CHESTER and NORRISTOWN, in Pennsylvania.

Lines of steamships (Fig. 54) run from Philadelphia to the leading seaports of the United States and foreign countries. Because of its nearness to the coal fields, Philadelphia has become a great shipping point for coal. The coal and iron have made possible the manufacture of cars, heavy machinery, and steel ships (Fig. 55) at Philadelphia and WILMINGTON. Philadelphia is a center for manufacturing textiles, especially woolen goods; there is much manufacturing of clothing; and in the manufacture of carpets this is the most important city in the country.

Philadelphia is called the *Quaker City*, because it was founded by William Penn and other Quakers, many of whose descendants still live there. It was the home of Benjamin Franklin; and at one time, before Washington was built, it was the capital of the United States. Independence Hall, in which the Declaration of Independence was signed, and in which the Constitution of the United States was written, is still standing (Fig. 56).

4. Other cities in Pennsylvania

Pennsylvania has the city of ERIE, on Lake Erie, as New York has Buffalo; but, while Erie is an important shipping and manufacturing center, it is much smaller than Buffalo. The city in Pennsylvania that ranks next to Philadelphia is PITTSBURGH, the eighth city in size in the United States. Pittsburgh is located at the point where the Allegheny and Monongahela rivers unite to form the Ohio River, and therefore has extensive water connections. It is a center for the manufac-

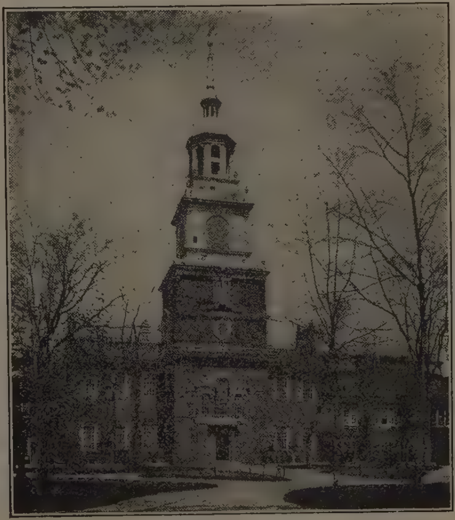


FIG. 56. — Independence Hall, in Philadelphia.

ture of iron and steel, and of articles made from them. Indeed, for such work it is the greatest center in the country.

5. Boston

The most important of the New England cities is Boston, the fifth city in size in the United States. It is a great manufacturing center, being engaged in most of the industries already named, and especially in making clothing. Its size is chiefly due to its excellent harbor and its central location.

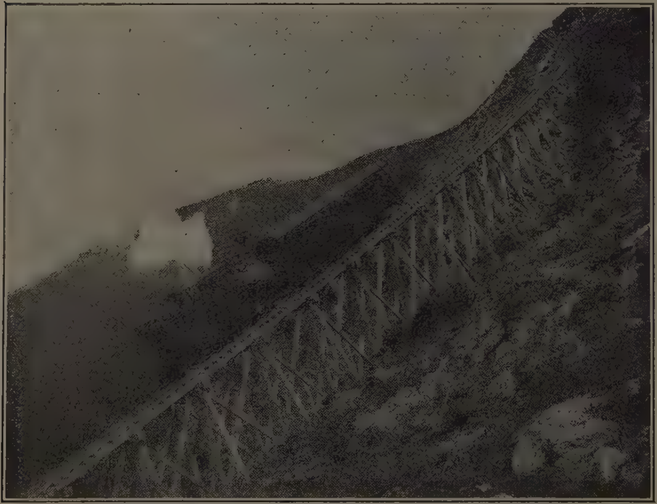


Fig. 57.— The railway up the slopes of Mount Washington, on which thousands of summer visitors are taken to the top of the mountain every summer.

The port of Boston is fourth only to that of New York in importance in the United States. Great quantities of raw materials are received here, to be sent to the factories of New England; and the finished goods are shipped over all the world. Much grain and meat reach Boston from the West to be distributed among smaller cities, or to be shipped abroad. In return, ships from foreign countries bring such articles as coffee, tea, chocolate, rubber, wool, hides, and bananas, which are needed in New England.

6. Other large cities of New England

Portland, the largest city in Maine, has an excellent harbor. New Haven, the largest city in Connecticut, and Providence the largest in Rhode Island, are both on the seacoast.

The seacoast of New Hampshire is very small, and the largest city, Manchester, lies inland near some falls in the Merrimac River; but on the coast is the important city of Portsmouth. Vermont has *no* seacoast. Its largest city, Burlington, is a lake port on Lake Champlain.

Summer resorts

1. Why a need of vacations

There is so much manufacturing and commerce in the Northeastern States that great numbers of people dwell in the cities; and during most of the year they are closely confined in noisy factories, or in offices and stores. To these, the wooded mountains, the silvery lakes, the rivers, with their falls and rapids, the green valleys, and the sandy or rocky seacoast offer great attractions; and every summer tens of thousands run away from town for a week or more, to enjoy their vacations at such places.

2. Where the people spend their vacations

Many go to the green slopes and woods of the Adirondacks or the Catskills, in New York; or to the Berkshire Hills of Massachusetts; or to the White Mountains of New Hampshire (Fig. 29); or to the mountains in Pennsylvania. Here they can enjoy the scenery and the mountain life to their hearts' content. Others plunge into the woods of Maine or northern New Hampshire, to hunt and fish, or to canoe upon the streams and lakes; and still others settle down at farmhouses, to enjoy the quiet of the country.

Many others visit the seashore to escape the heat and to bathe in the salt water, or to sail and row. So many go there, that a large part of the coast is dotted with summer cottages and hotels. Indeed, people come here from all parts of the United States. Thousands visit Atlantic City and Long Branch on the New Jersey coast. Nantucket Island and Martha's Vineyard are similar resorts farther north; while just west of them, on Narragansett Bay, is NEWPORT, noted for its many magnificent summer homes.

Along the coast for many miles north and south of Boston there are noted summer resorts; and the especially cool summers on the coast of Maine also attract great numbers of people.

Review Questions

1. What can you say about the area of the Northeastern States? 2. Describe their surface. 3. Name and locate the principal mountainous regions. 4. Describe the coast line. 5. Explain what has made it so irregular. 6. Describe the climate in the north, with some of the reasons. 7. In the south. 8. What can you say about the population of these states? 9. Why is the population so great? 10. Explain the importance of agriculture. 11. Tell about poultry raising and truck farming. 12. Dairying. 13. Fruits and vegetables. 14. Name other very important farm products. 15. What can you say about the supply of food? 16. Locate the forests. 17. Tell how the lumbering industry is carried on. 18. Why is it desirable that our forests be saved from destruction? What is being done in some states to preserve these forests? 19. What about the abundance of fish in these waters? 20. Name and locate the centers of the fishing industry. 21. Tell about the mackerel fishing. 22. Fishing for halibut and cod. 23. Other ocean foods. 24. About the stone and clay. 25. About the salt industry. 26. About the production of petroleum and gas. 27. How has coal been formed? 28. What is the origin of the different kinds of coal? 29. Tell about the amounts and kinds of coal in Pennsylvania. 30. Describe the method of mining coal. 31. State the uses of coal. 32. Where is iron ore found? Tell about its importance. 33. Its appearance. 34. Why is manufacturing especially important in these states? 35. How is iron made? 36. Name the kinds of iron. 37. Locate the principal centers for work in metal, and name the articles made. 38. Tell about the manufacture of glass. 39. Pottery and brick. 40. Cement. 41. Give some idea of the extent and variety of the cotton and woolen manufacture. 42. Name and locate the chief cities engaged in textile manufacture. 43. What cities are engaged in leather manufacture, and what are some of the articles made? 44. How is leather prepared? 45. Describe the method of making boots and shoes. 46. Tell about manufactures from the forest. 47. Name other prominent kinds of manufacturing in these states. 48. Tell about changes that have taken place in methods of manufacturing. 49. Why is commerce especially important in these states? 50. What about the harbors? 51. Connections with the interior by water? 52. By rail? 53. Name and locate several cities very near New York. What is the population in and near New York? 54. Give reasons for so vast a population. 55. Describe life in the great city. 56. State some facts about Buffalo, and cities along the Erie Canal. 57. Tell about Philadelphia and neighboring cities. 58. Other cities in Pennsylvania. 59. Boston. 60. Other large cities. 61. Explain the special need of vacations for people living in great cities. 62. Where and how do the people in these states spend them?

Review Questions by States

Maine (Me.). 1. Draw the coast line of Maine. 2. Why is it so irregular? 3. Find the principal rivers. 4. What cities are situated on each? 5. Should you expect much fishing along the coast? Why? 6. What reasons can you give why so many people resort to the Maine coast and woods in summer? 7. Describe lumbering in Maine. 8. Which is the largest city? How does it compare in size with Boston and Providence? (See Appendix at end of book.) 9. What other cities in Maine are mentioned in the text? Find them on the map. 10. Draw an outline map of Maine, locating the principal rivers and lakes, the capital, and other leading cities. Do the same for each of the other states as you study about it.

New Hampshire (N.H.). 11. What large lakes are found in this state? What river? 12. Name the cities on it. 13. For what are they important? 14. Why are there not more cities in northern New Hampshire? 15. What industry should you expect there? 16. Locate the White Mountains. 17. Where should you expect to find most farming? 18. How does the largest city in the state compare in size with Portland?

Vermont (Vt.). 19. What large lake forms a part of the western boundary? Into what waters does it empty? 20. What river flows along the eastern boundary? Through what states does it flow? 21. What is the name of the mountains?

22. Lumbering is carried on, as in Maine. Into what waters must the lumber be floated? 23. What other Vermont industries are mentioned in the text? 24. There is also farming in the fertile valleys, and manufacturing, as at Brattleboro. Find Brattleboro. 25. Compare the size of the largest city with that of Manchester, N.H.

Massachusetts (Mass.). 26. Compare Massachusetts with Vermont and Maine in area; in population. (See Appendix.) 27. Find the principal cities mentioned in the text, and tell where each is located. 28. For what is each important? 29. What advantages do you see in the location of each? 30. Name several seaports; several manufacturing cities. 31. Where is the mountainous portion of the state? 32. What effect should you expect the mountains to have upon agriculture? 33. State as clearly as you can the reasons why Boston has grown to be a large city. 34. Of what importance is Boston to the cities near by? 35. Of what importance are they to Boston?

Rhode Island (R.I.). 36. Compare this state with Massachusetts and Maine in area. It is the smallest state in the Union. 37. What is the name of the bay in this state? What cities are located on it? 38. What large city is in Rhode Island? How is it important? 39. Compare its size with that of Boston and Portland. 40. Should you expect much lumbering in Rhode Island? Why? 41. What kind of farming? Why?

Connecticut (Conn. or Ct.). 42. Where are the mountains in this state? 43. Locate each of the cities mentioned in the text. 44. Tell how each is important. 45. The farms of Connecticut average better than those of Maine. Why? 46. There is little lumbering in the state. Why? 47. Compare the size of New Haven with that of Boston and Portland.

New York (N.Y.). 48. Where are the mountains? 49. What are their names? 50. Why are forests extensive here? Why is there little agriculture among the mountains? 51. What about the surface features of the rest of the state? 52. What about the extent of agriculture? 53. Tell about the dairying. 54. What fruits are important in New York, and where are they raised? 55. What waters form parts of the boundary of the state? 56. Into what rivers do the lakes empty? 57. What rivers drain New York? 58. State clearly the importance of the Erie Canal. 59. Which cities mentioned in the text are on the canal? Which are on the Hudson? 60. Compare New York in size with all of New England.

New Jersey (N.J.). 61. Why should peaches and grapes grow better in New Jersey than in New England? 62. Name and locate each of the cities mentioned in the text. 63. For what is each important? 64. In what ways are some of the largest cities dependent upon the products of Pennsylvania? 65. What cities in New Jersey are situated on or very close to New York Bay?

Pennsylvania (Pa. or Penn.). 66. Where would you look for the best farm land? 67. The principal forests? 68. The leading coal mines? 69. Where are the principal cities? Why located where they are? 70. Why is manufacturing so important in this state? 71. What kind of manufacturing is especially important? Why? 72. What advantage do you see in the position of Pittsburgh? 73. By or through what states would one pass in going by boat from Pittsburgh to the Gulf of Mexico? 74. Measure the length and width of Pennsylvania. Also find its area. (See Appendix.) 75. Is Pennsylvania larger or smaller than New York? New England? 76. Is it larger or smaller than the state you live in? How much?

General Review Questions

1. Describe the surface features of this group of states from the relief maps (Figs. 27 and 28). 2. State the principal industries. 3. In which states are they carried on? 4. Make a list of the ten largest cities. 5. Locate each of these cities, and explain its importance. 6. Make a drawing of these states, including the chief rivers, cities, mountains, and the state boundaries.

Suggestions

1. Make a drawing of New York State, showing the Hudson River and the Erie Canal. 2. Explain why New York City and Buffalo, at opposite ends of the state, are such large cities. 3. How can a canal be built where land is not level? 4. Give reasons why freight charges are less on canals than on railroads. 5. Make a collection, for the school, of some marble, granite, slate, hard coal, soft coal, cotton, wool, leather, and iron ore. 6. Collect samples of cast iron, wrought iron, and steel. 7. Write a composition telling why one might prefer to live in a large city, or in the country. 8. What names beginning with *New* do you find on the map? How can you explain such frequent use of this word? 9. Write the abbreviation for each of the states in this group. 10. Name and locate the capital of each state in this group. 11. Find from what places in these states canned fruits and vegetables, sold in a neighboring grocery store, are obtained. 12. Visit some factory near you. Find how many persons are employed there, how much raw material is consumed per week, and how much it costs.

3. The Southern States

Map study

1. Where are the principal mountains in this section? 2. Which states have no mountains? 3. In what direction do the rivers mainly flow? 4. Trace the largest river and its chief tributaries. 5. What river forms the boundary between Texas and Mexico? 6. Estimate the length of the boundary line formed by this river. 7. How far distant are the southern points of Florida and Texas from the Tropic of Cancer? 8. What does this fact tell you about their climate? 9. Which of these states have no sea coast? 10. Is the coast line more or less regular than that of New England? 11. Which of these two coast lines probably has the greater number of good harbors? Why do you think so?

Area and population

The sixteen states in this group include the largest one east of the Mississippi River, which is Georgia, as well as the largest one west of it, which is Texas. Together they have more than one-fourth the area of the entire United States (not including Alaska and the Philippines).

Their population, also, is a little more than one-fourth that of our entire country. It is much less dense than that of the Northeastern States, and represents about the average density for all the states taken together.

The kinds of occupations in any region largely determine the density of population there. Farming, for example, allows few people, and manufacturing brings them together in great numbers. We may expect, therefore, that manufacturing will be less prominent here than in the Northeastern States, and that some other industries will be more important.

Surface Features

1. Resemblance of principal mountainous section to that farther north

The map shows that the Appalachian Mountains continue southwestward into Alabama. They are generally low with fertile valleys here and there as in Pennsylvania; yet the highest peak of the entire system is Mount Mitchell in North Carolina. In the Appendix (p. 397) see how its height compares with that of Mount Washington in New Hampshire.

2. The Plains in the Eastern Part

(1) ***The Piedmont Plateau***

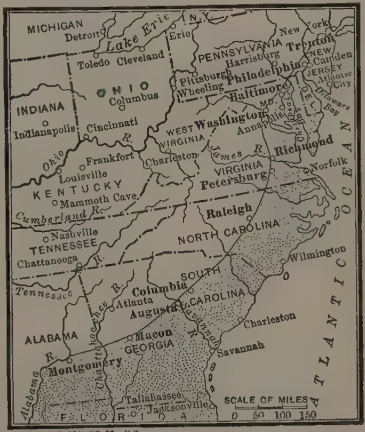
The plains east and southeast of the Appalachians are a continuation of those farther north. First there is the Piedmont Plateau, which slopes gradually from the base of the mountains, where it is near 1000 feet above sea level, about half the distance to the coast. Estimate the width of this plateau by use of the scale in Figure 59.

(2) ***The Coastal Plain***

The low plain along the coast is called the Coastal Plain. It extends all the way from New Jersey to western Texas and includes the entire state of Florida. Much of this land is level; yet the direction of the slope is clearly shown in the course taken by the rivers. Name and trace the principal rivers that cross this plain.

(3) ***The Fall Line and its importance***

From New York to Alabama the streams that flow from the Piedmont Plateau to the Coastal Plain have rapids and falls where they cross the dividing line between these two regions. This boundary is, therefore, called the *Fall Line* (Fig. 58). There are rapids and falls along this line, because the streams have been able to dig more rapidly into the soft layers of the Coastal Plain than into the harder rocks of the Piedmont Plateau.



WILLIAMS ENGRAVING CO., N.Y.

FIG. 58. — The Fall Line. Coastal Plain dotted, Piedmont and other sections left white. Cities printed in heavy type are located along the Fall Line.

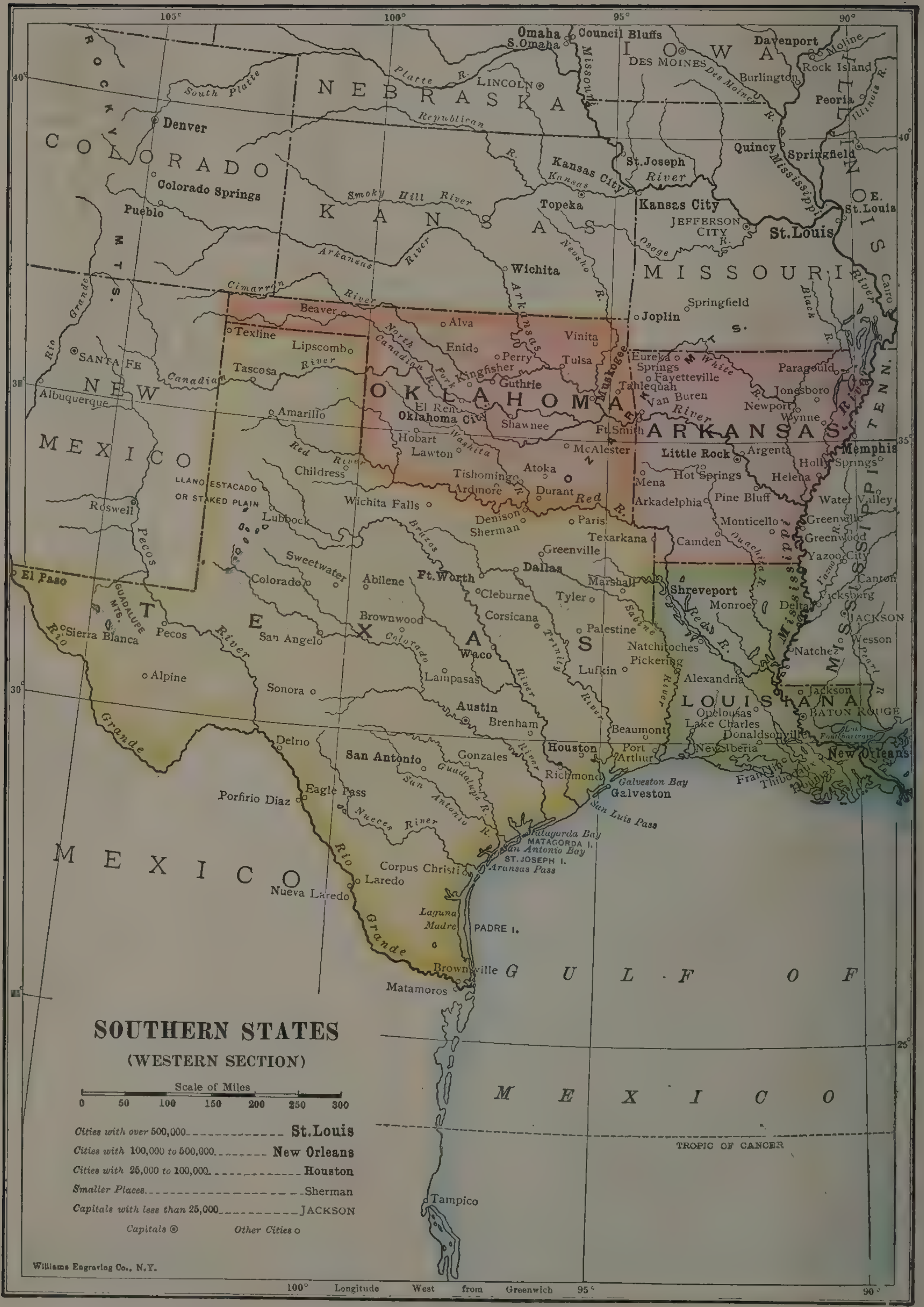

SOUTHERN STATES
(WESTERN SECTION)
Scale of Miles
0 50 100 150 200 250 300
Cities with over 500,000 St.Louis
Cities with 100,000 to 500,000 New Orleans
Cities with 25,000 to 100,000 Houston
Smaller Places Sherman
Capitals with less than 25,000 JACKSON
Capitals ⊙ Other Cities ○
Williams Engraving Co., N.Y.
105° 100° 95° 90°
40° 35° 30° 25°
Longitude West from Greenwich
TROPIC OF CANCER
NEBRASKA
IOWA
ILLINOIS
COLORADO
KANSAS
MISSOURI
OKLAHOMA
ARKANSAS
NEW MEXICO
TEXAS
LOUISIANA
MISSISSIPPI
TENN.
MEXICO
GULF OF MEXICO
ROCKY MTS.
OZARK MTS.
GUADALUPE MTS.
LLANO ESTACADO OR STAKED PLAIN
Omaha
S.Omaha
Council Bluffs
DES MOINES
Davenport
Moline
Rock Island
Burlington
Peoria
LINCOLN
Denver
Colorado Springs
Pueblo
St.Joseph
Kansas City
Quincy
Springfield
Topeka
JEFFERSON CITY
St.Louis
E. St.Louis
Cairo
Wichita
Joplin
Springfield
Beaver
Alva
Enid
Vinita
Perry
Tulsa
Kingfisher
Guthrie
Muskogee
Tahlequah
Eureka Springs
Fayetteville
Van Buren
Ft.Smith
El Reno
Oklahoma City
Shawnee
Hobart
Lawton
McAlester
Atoka
Tishomingo
Ardmore
Durant
Paragould
Jonesboro
Newport
Wynne
Little Rock
Argenta
Memphis
Holly Springs
Helena
Hot Springs
Mena
Arkadelphia
Pine Bluff
Monticello
Camden
Texline
Lipscomb
Tascosa
Amarillo
Childress
Wichita Falls
Lubbock
Denison
Sherman
Paris
Texarkana
Greenville
Dallas
Ft.Worth
Abilene
Sweetwater
Colorado
Marshall
Shreveport
Tyler
Cleburne
Corsicana
Brownwood
Palestine
San Angelo
Waco
Natchitoches
Pickering
Lufkin
Lampasas
Alexandria
Austin
Brenham
Beaumont
Port Arthur
Houston
Richmond
Galveston
Gonzales
San Antonio
Sonora
Alpine
Pecos
Sierra Blanca
El Paso
Delrio
Eagle Pass
Porfirio Diaz
Corpus Christi
Laredo
Nueva Laredo
Brownsville
Matamoros
Tampico
SANTA FE
Albuquerque
Roswell
Monroe
Delta
Vicksburg
JACKSON
Wesson
Natchez
Water Valley
Greenville
Greenwood
Yazoo City
Canton
Jackson
BATON ROUGE
Opelousas
Lake Charles
Donaldsonville
New Iberia
Franklin
Thibodaux
Houma
New Orleans
Galveston Bay
San Luis Pass
Matagorda Bay
MATAGORDA I.
San Antonio Bay
ST. JOSEPH I.
Aransas Pass
Laguna Madre
PADRE I.
L. Pontchartrain
Platte R.
South Platte
Republican R.
Missouri R.
Des Moines R.
Illinois R.
Mississippi R.
Smoky Hill River
Kansas River
Arkansas River
Cimarron River
Neosho R.
Osage R.
Black R.
White R.
North Canadian R.
North Fork
Canadian River
Washita R.
Red River
Brazos R.
Colorado R.
Trinity River
Sabine R.
Neches River
Ouachita R.
Yazoo R.
Pearl R.
Guadalupe R.
San Antonio R.
Nueces River
Pecos R.
Rio Grande

FIG. 59.

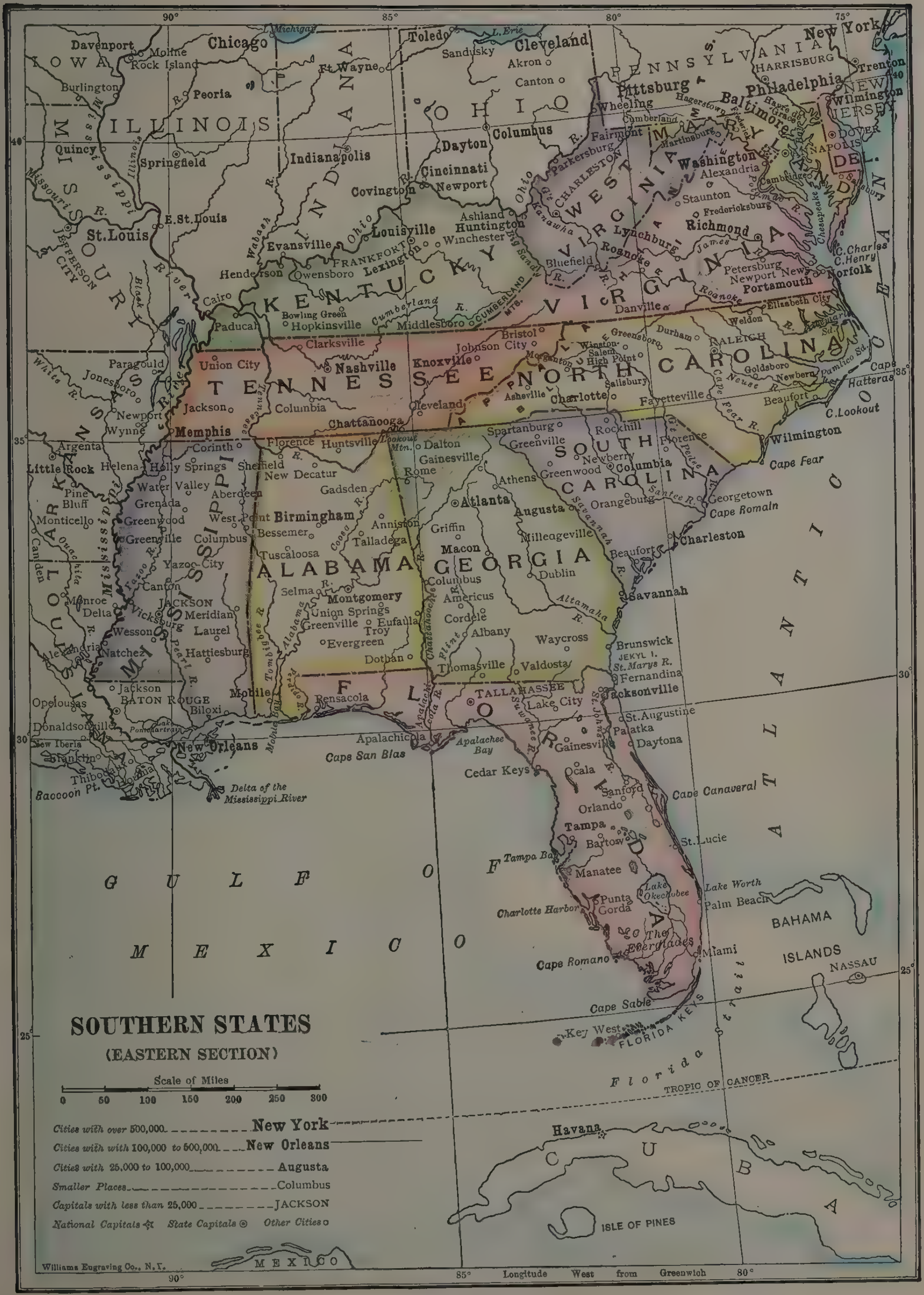

SOUTHERN STATES
(EASTERN SECTION)
Scale of Miles
0 50 100 150 200 250 300
Cities with over 500,000 New York
Cities with with 100,000 to 500,000 New Orleans
Cities with 25,000 to 100,000 Augusta
Smaller Places Columbus
Capitals with less than 25,000 JACKSON
National Capitals State Capitals Other Cities
Williams Engraving Co., N.Y.
Longitude West from Greenwich
90° 85° 80° 75°
40° 35° 30° 25°
IOWA
ILLINOIS
INDIANA
OHIO
PENNSYLVANIA
NEW JERSEY
DEL.
MARYLAND
MISSOURI
KENTUCKY
WEST VIRGINIA
VIRGINIA
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
ARKANSAS
MISSISSIPPI
ALABAMA
GEORGIA
LOUISIANA
FLORIDA
APPALACHIAN
CUMBERLAND MTS.
ATLANTIC OCEAN
GULF OF MEXICO
BAHAMA ISLANDS
NASSAU
CUBA
Havana
ISLE OF PINES
MEXICO
TROPIC OF CANCER
Florida Strait
FLORIDA KEYS
Key West
Cape Sable
Cape Romano
The Everglades
Lake Okeechobee
Charlotte Harbor
Tampa Bay
Cape Canaveral
Cape Hatteras
C. Lookout
Cape Fear
Cape Romain
Cape San Blas
Apalachee Bay
Delta of the Mississippi River
Raccoon Pt.
Chicago
Cleveland
Pittsburg
Philadelphia
Baltimore
Washington
New York
Richmond
Norfolk
Louisville
Cincinnati
St. Louis
Nashville
Memphis
Knoxville
Chattanooga
Atlanta
Birmingham
Montgomery
Mobile
New Orleans
Charleston
Savannah
Jacksonville
Tampa
Miami

FIG. 59.

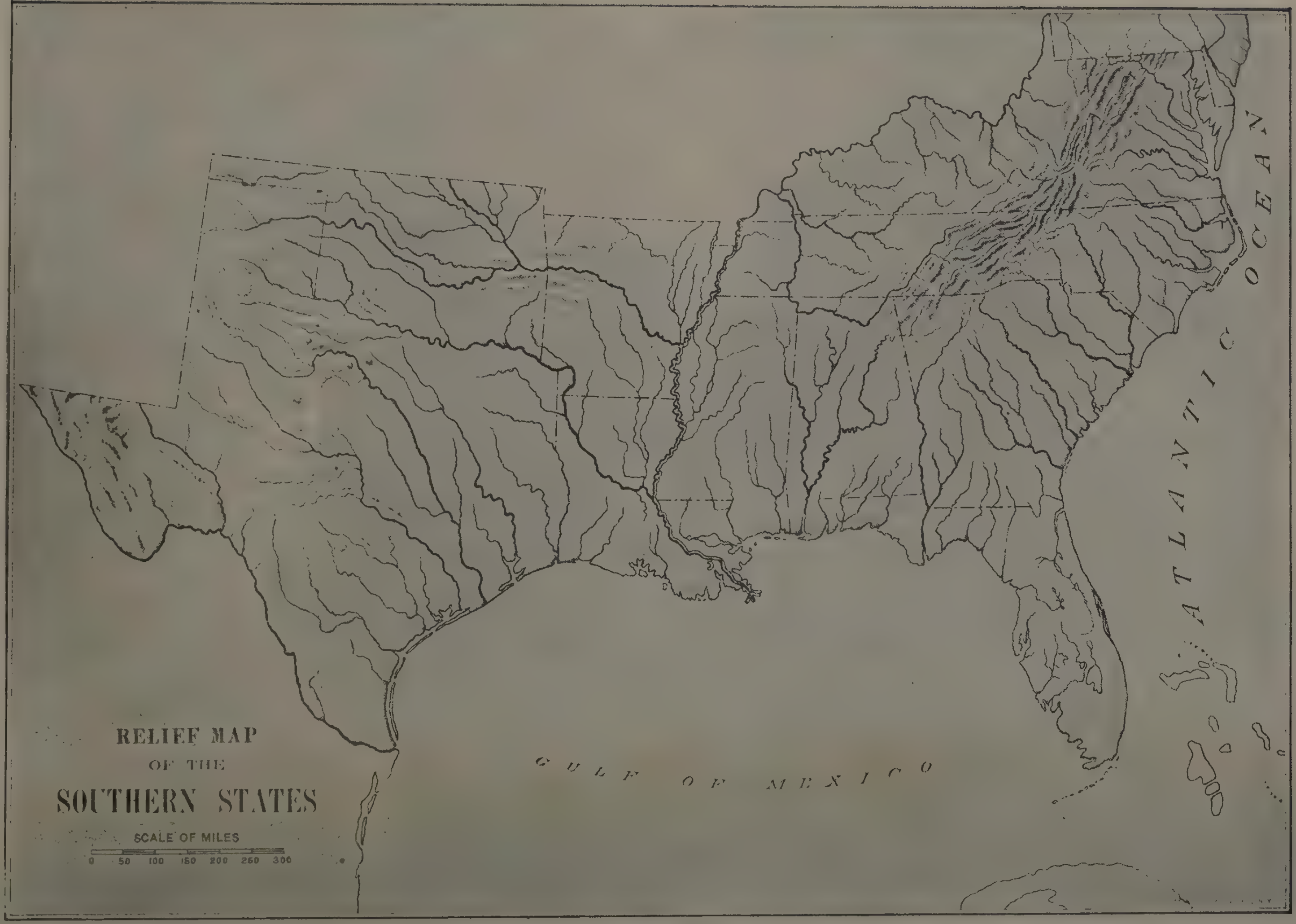

ATLANTIC OCEAN
GULF OF MEXICO
RELIEF MAP
OF THE
SOUTHERN STATES
SCALE OF MILES
0 50 100 150 200 250 300

FIG. 60.

Before white men came, the Indians placed their villages on the streams along this line. The early settlers also located their villages here, partly because of the water power, and partly because boats going upstream were stopped by the rapids and falls. Now many of these villages have become large cities. Note (Fig. 58) how many cities are on the Fall Line. Name them.

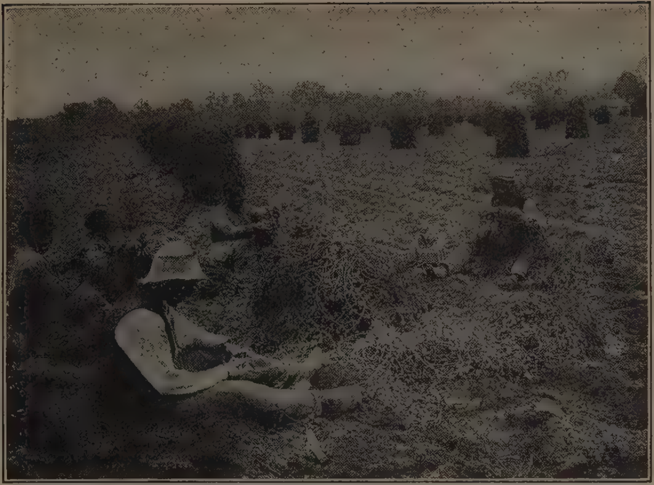


FIG. 61. — A view in the Southern States. Much of the land is as level as this. The crop raised in this field is the peanut, which the boys and girls are picking from the roots of the peanut plants.

(4) *Other plains*

As in western Pennsylvania, the portions of these states just west of the Appalachian Mountains are a low plateau deeply cut by river valleys. It gradually becomes lower and more regular farther west, until it merges into the broad and fertile plains of the Mississippi Valley.

West of the Mississippi the land gradually rises again until in western Texas and Oklahoma it forms a plateau 4000 to 5000 feet above the level of the sea. This plateau region is a part of the Great Plains of the West.

One of the most level parts of this region is along the Mississippi River. This river is bordered on both sides by broad, fertile flood plains; and at its mouth is a large and very level delta, whose surface is only a few feet above the sea.

3. The coast line

Chesapeake Bay affords several excellent harbors. South of Norfolk the coast line is much more regular, and fine harbors are not so numerous as they are in the Northeastern States. There are a number of bays, and on some of them there are good harbors. But others are too shallow for large vessels, and some of them are shut in by sand bars. Where cities have grown on such bays the entrances are kept open by dredging or by building jetties which cause a current that sweeps the sand away from the channel.

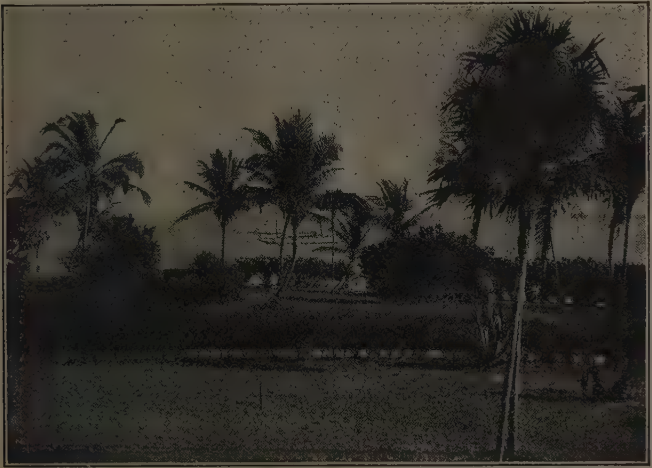


FIG. 62. — A view at Miami in Florida, showing the palms and other vegetation of a warm climate.

Southern Florida has a very irregular coast with many reefs

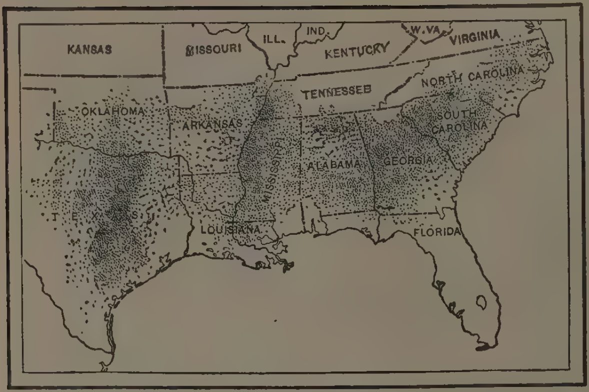


FIG. 63. — The cotton belt. Each dot represents 1,000,000 pounds of cotton.

and small islands, called *keys*. This irregular coast, and in fact the whole southern end of Florida, has been the work of coral polyps. These animals live in countless numbers in the warm waters of the Gulf Stream which flows along the Florida coast. They have built coral reefs here, and the limestone of southern Florida is made of the remains of the coral.

The climate

The climate of these states has two advantages over that of the Northeastern States. The rainfall is heavier except in western Texas; and the temperature is much milder. The danger from frost to growing crops is much less, and the winters are far less severe.

During the cold, disagreeable Northern winter, the weather in the South is mild, like spring and autumn in the North. In that part bordering on the Gulf of Mexico flowers are in blossom and birds are singing, many of the birds having migrated there from the North for the winter. Large numbers of Northern people also go South to spend the winter.

The summers too are more favorable, for they are longer than in the Northeastern States. Therefore, many kinds of plants can be grown here that cannot live in the North. It is easier also to raise cattle and other live stock. They can be left out of doors in winter, and can find grass to eat when the ground in the North is frozen and covered with snow.

Agriculture

With its fertile soil and favorable climate the South has naturally become a great agricultural country. It is far better suited to farming than the Northeastern States. Many people are engaged in other occupations, it is true, but farming is the leading industry.

1. Cotton

The crop that exceeds every other in value, in the South, is cotton. The early colonists soon discovered that cotton could easily be raised here, and that there was a ready market for it abroad. The cotton fields, or *plantations*, were very large, and there was a vast amount of work in planting and picking the cotton, and in separating the fiber from the seed.

FIG. 64. — A cotton field on a Southern plantation in the picking season.

In 1914 the Southern States produced about 15,000,000 bales of cotton, each weighing a little over 500 pounds. In the same year the rest of the entire world produced a little over 10,000,000 bales, which makes it clear that the United States furnished much more than half of all the cotton grown. Every person has use for cotton. Dresses, hosiery, much underclothing, thread, and, indeed, hundreds of articles are made of it. We see, then, that one of the chief industries of the Southern States is to help clothe the peoples of the world. The amount of cotton raised in one year is usually worth more than all the gold and silver mined in the whole world in a year. It is also worth as much as all the wheat produced in the United States in a year, or even more. Even if there were no other crop raised there, cotton alone would make the Southern States of great importance.

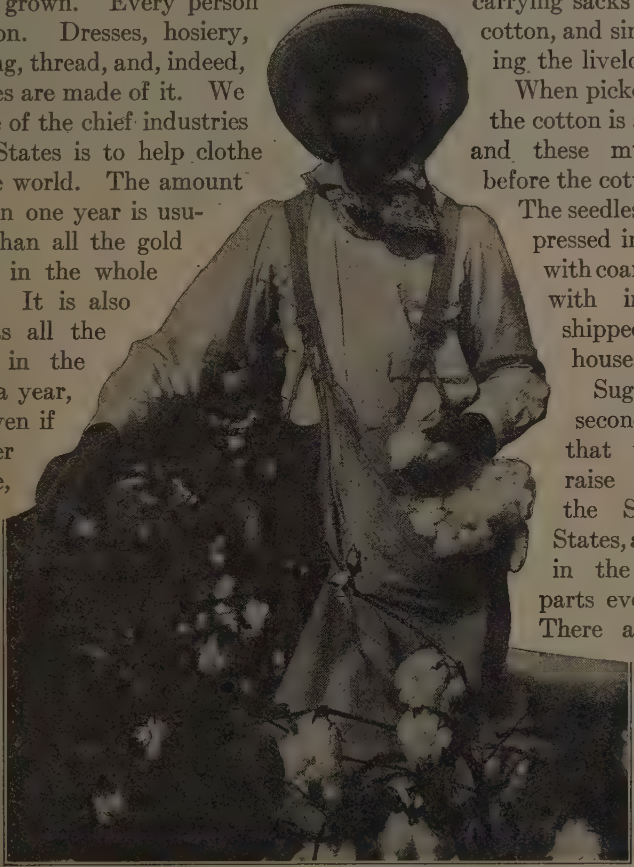


Fig. 65. — Picking cotton on a Southern plantation. The white, woolly cotton is seen on the plant in the lower right-hand corner.

(1) *Method of raising and marketing it*

The cotton seeds are planted in the spring, in rows about three feet apart, and the weeds are kept out until the plants are nearly grown. The cotton plant reaches a height of two or three feet, and bears large blossoms which produce pods, in which the cotton and cotton seed are inclosed. When ripe, the pods burst open, showing the white tufts of *cotton*, resembling in appearance the downy substance in the thistle, or in the pod of the milkweed.

When a great number of these pods have opened, a cotton plantation presents a beautiful sight, — much like a field flecked with snow (Fig. 64). Then the busy season for the pickers begins. Many men, women, and children may be at work in one field, carrying sacks to be filled with cotton, and singing and chattering the livelong day.

When picked from the bolls, the cotton is attached to seeds, and these must be removed before the cotton can be of use. The seedless cotton is tightly pressed into bales, covered with coarse bagging, bound with iron bands, and shipped to the warehouses, to be sold.

2. Sugar cane and sugar

(1) *Plants from which sugar is obtained*

Sugar cane is a second important crop that we can raise only in the Southern States, and only in the warmer parts even here. There are a number of plants from whose sap sugar is made. One of these, the sugar maple tree, has already been mentioned (p. 40); another is the sugar beet, raised in great quantities in Europe, and also, of late, in many of our states. This beet is now a very important source of sugar, because it can be raised in a cool, temperate climate. For a long time, however, the chief source of sugar has been the sugar cane, a plant that looks somewhat like corn (Fig. 66).

Sugar cane requires a fertile soil, and

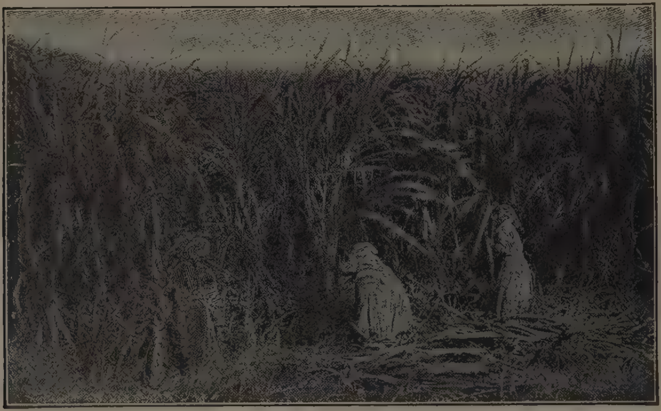


FIG. 66. — Cutting the sugar cane on a plantation in Louisiana.

(2) *Where sugar cane is grown*

grows only in warm regions where there is little or no frost, even in winter. For this reason most of the cane sugar comes from tropical lands. Our most noted sugar district is the delta of the Mississippi River in Louisiana; but sugar growing is increasing in importance in Texas and in Georgia.

(3) *How it is cultivated*

Some single plantations in these states have several thousand acres in sugar cane. The cane is planted in either the fall or spring, in rows about six feet apart. Some of the stalks grow in the summer to be two or more inches in diameter, and reach such a height that a man riding through a field on horseback may be entirely hidden from view. The cane is ready to be cut in the fall, after the middle of October. As soon as the stalks are cut, they are drawn to the sugarhouse in wagons, or, on the larger plantations, in railway cars (Fig. 67).

(4) *How the sugar is obtained*

In the sugarhouse the cane is crushed between rollers in order to squeeze out the juice. The waste cane, left after the juice is pressed out, is used as a fuel to run the engines of the sugarhouse; the juice, or sap, is placed in large vats and warmed, to drive out the water in it and to crystallize the sugar. This leaves two products, a thick black molasses and brown sugar. Some large sugarhouses produce as much as 14,000,000 pounds of sugar in a year.

The crude, brown sugar is sent from the sugarhouse to a refinery, either in NEW ORLEANS or in the North. At the refinery it is changed to white sugar, from which the various grades of granulated, powdered, and lump sugar are made.

The molasses is used for various purposes, some of it being manufactured into sirup for the table, and some of it into rum. Molasses is a by-product, and is not of great value to the sugar grower.

3. Rice

(1) *Its importance as a food*

Rice, a third Southern crop that is not grown in the North, is one of the most important foods in the world; it is, in fact, the chief food of some people. It is not eaten

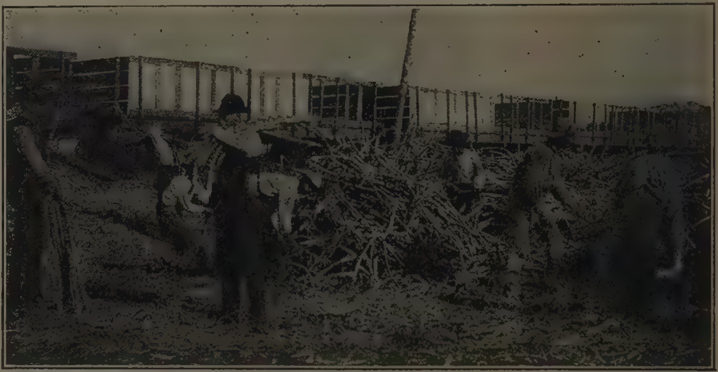


FIG. 67. — Carrying the sugar cane to the cars which will take it to the sugarhouse. A scene on a Louisiana plantation.

FIG. 68. — Threshing rice on a large rice plantation in Louisiana.

so much in our country, but still we use far more than we raise.

(2) Why we may raise more in the future

One reason why we have raised too little rice for our use is that it requires a warm climate and a damp, even a swampy soil. The climate is suitable in many parts of the South, but the wet soil is not so common. On the Coastal Plain and the river flood plains, from the Carolinas to Texas, there is some such land. There rice culture has long been carried on, the principal districts being in Louisiana, Texas, and South Carolina.

In recent years rice production has been greatly increased by irrigation. By leading the water from streams, or springs, it has been found possible to make the soil as wet as necessary even on some of the higher, well-drained plains. With irrigation, rice culture may be carried on over much of the warmer part of the South. Some day, therefore, our country may supply all the rice we need, and even have some to spare. Louisiana, Texas, and South Carolina produce most of the rice now raised in the country, though some comes from other Southern States.

(3) Method of cultivating and preparing for market

To raise rice the ground must first be prepared, as for other grains. After the seeds are planted, the fields are flooded. As the plant grows, it forms a slender stalk, from three to six feet high, upon the top of which appears a head of seed somewhat

FIG. 69. — A field of tobacco in Tennessee.

resembling a head of oats. Shortly before the harvest season the water is drawn off, so that horses may be used in harvesting the crop. The rice is then cut and the kernels threshed out, as in the case of wheat. After the hull is removed, the grains are sent to NEW ORLEANS, GALVESTON, SAVANNAH, or CHARLESTON, to be polished, after which they are ready for market.

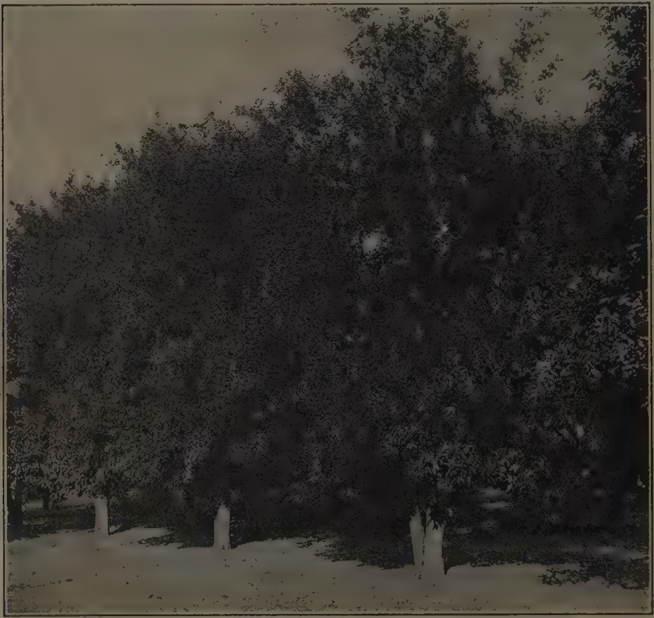


FIG. 70. — An orange grove near Jacksonville, Florida.

4. Tobacco

Unlike cotton, rice, and sugar cane, tobacco is not confined to our Southern States. Yet it is naturally a Southern plant, and is raised in the North in only a few places where conditions are especially favorable. Tobacco is cultivated in all the Southern States; Virginia, Kentucky, North Carolina, and Tennessee are the leading states in its production. LOUISVILLE, Ky., RICHMOND and PETERSBURG, Va., CLARKSVILLE, Tenn., and DURHAM, N. C., are centers for trade in tobacco.

5. Fruits and vegetables

Fruits, such as strawberries, watermelons, apples, peaches, pears, grapes, and oranges, flourish in the warm climate of the Southern States; so do vegetables, such as peas, beans, potatoes, sweet potatoes, and tomatoes. All these ripen earlier than in the North.

Florida is so far south that it has fruits of an entirely different kind. Besides oranges (Fig. 70), there are lemon and grapefruit groves in many parts of the state. In southern Florida the climate is so warm that even tender tropical plants, such as cocoanuts and pineapples, thrive there. The pineapple plant, whose fruit is nestled in the midst of sharp-pointed leaves, grows especially well on the low coral keys and reefs that fringe the southern tip of Florida.

Fruits and vegetables from the South are sent in great quantities to the North, where they appear in the markets early in the spring. The oranges are sent throughout the winter. Thousands of bushels of fruit and vegetables are shipped at one time, by fast train or steamer, and at the proper season one may even see a whole train load of strawberries. Quantities of fruits and vegetables are canned in the South.

6. Other farm products

Many other crops besides those named are raised in the South, corn, wheat, and hay being among the most important. An immense quantity of corn is produced (Fig. 71), and over even a wider area than cotton itself; but since corn and wheat are raised even more extensively in other states, these grains are treated later (pp. 86 and 87).

Milo maize and Kaffir corn are, however, raised extensively in the South. These hardy plants grow well in regions of little rainfall. The leaves and grain make excellent food for cattle.

Peanuts and sweet potatoes are two valuable products of these states. Stock of various kinds, such as horses, cattle, sheep, and hogs, is also raised, each plantation usually having some of these animals. Large numbers of cattle are also reared in the open pine forests of the Coastal Plain, especially in Florida and Georgia.

Live stock

Kentucky is famous for its fine stock, especially horses and mules, raised in the "Blue Grass Region" about Lexington. The grass here has a bluish color, and is very nourishing, making possible the raising of fine stock.

The reason why this grass is so nourishing is that the soil in this section is made of bits of decayed limestone in which there is lime phosphate, an excellent plant food. This phosphate comes from the shells of small animals which lived in the sea that covered this region millions of years ago. On dying, they helped to make a deposit of sediment on the sea bottom; and this sediment has since changed to limestone rock, which is now raised above the sea. As the limestone decays, the phosphate mixes with other rock bits, and thus fertilizes the soil.

The abundance of limestone in this part of Kentucky is the reason for the numerous caves that exist there. These caves are long tunnels that have been slowly eaten out by water that percolates through the rock, dissolving the limestone. The largest of all is the *Mammoth Cave*, which is said to have more than one hundred and fifty miles of tunnels, or galleries. They wind about in an irregular manner, some being many feet below others, and all together forming a network, or *labyrinth*, into which a stranger dares not venture without a guide.

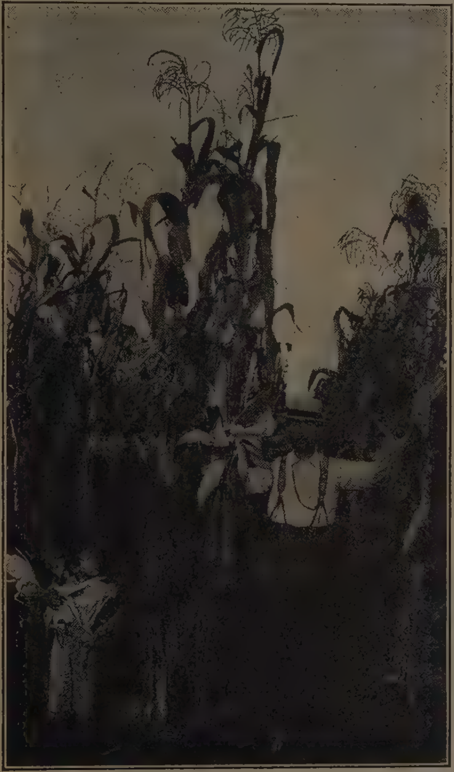


FIG. 71. — A field of corn in Arkansas. Notice how very tall the corn grows in this warm climate.

An important draft animal in the South, well suited to the warm climate, is the mule. On the fertile plains, especially in Tennessee, Missouri, and Kentucky, there are stock farms where particular attention is paid to raising mules and fine breeds of horses.

The soil of western Texas is exceptionally well adapted to general agriculture. The great plains that were used almost entirely for grazing are covered with deep, fertile soil, the alluvial deposit washed from the mountainous highlands. The climate is temperate and varies from almost continuous summer in the south into well-defined seasons in the north. Although the rainfall is light, in many cases sufficient water is obtained by storing the surplus water of the rainy season, water pumped from wells and water brought by canal from rivers. This is used advantageously for irrigation.

Cattle raising (Fig. 72) is one of the principal industries. The ranches are all well

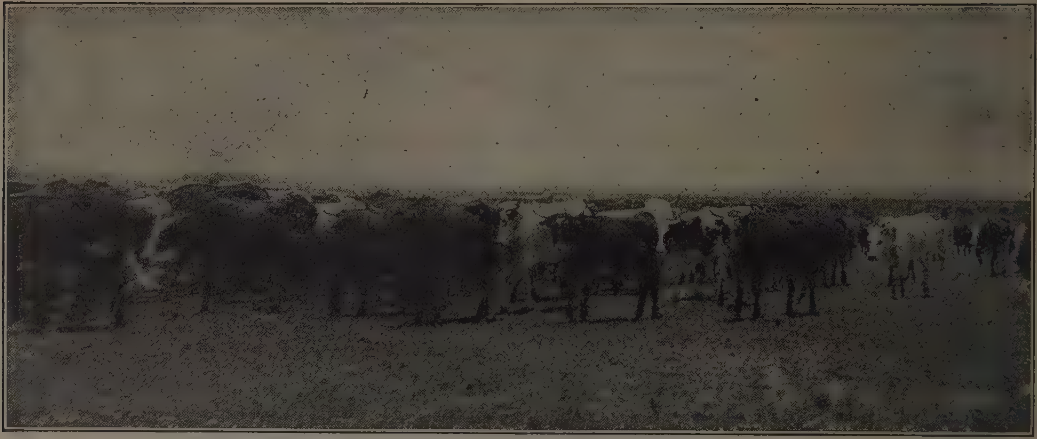


Fig. 72. — Cattle on a ranch in western Texas.

equipped, of good size, and fenced in; and fodder is available for winter keeping. The meat breed of cattle has been greatly improved and an excellent dairy breed has been introduced. Dry farming has been wonderfully developed and grain and fodder crops are produced in abundance. In the irrigated districts all kinds of fruits and vegetables are profitably raised. Texas leads the states in the production of cattle and mules and is rapidly gaining distinction on account of its agricultural products.

Lumbering

1. Kinds of trees, and their uses

The South is now the greatest lumber section in the country. There are immense tracts of forests on the Coastal Plain, on the river flood plains, and among the mountains. Among the forests are many trees either unknown or uncommon in the North, some of them, such as the magnolias, bearing large, sweet-scented flowers. Another is the live oak, whose green leaves remain on the tree all winter, and whose hard wood is highly valued for shipbuilding.

There is a great amount of hard pine — often called Georgia pine — on the Coastal Plain. This timber is sent to all the cities of the North. It is shipped from the coastal cities of Charleston, S.C., Savannah and Brunswick, Ga., Jacksonville and Pensacola, Fla., and Mobile, Ala., as well as from other seaports. On the higher lands such hardwoods as oak and hickory thrive (Fig. 73).

Fig. 73. — Lumbermen at work cutting hardwood logs in the mountains of western North Carolina.

In which states are these higher lands found? Quantities of hardwood are shipped from MEMPHIS and from other points, much of it coming from Arkansas.

2. Method of lumbering

The method of lumbering in the South is very different from that of the Northeastern States (p. 30). In the South there are no heavy snows to level the uneven ground and to cause floods in the streams. Therefore logs cannot be floated down to the tidewater by means of spring freshets. On this account the sawmills are located in the midst of the forests, if possible on the river banks. To them the logs are brought, either by water, by wagon, or by train and then are sawed into lumber.

Fishing

In this section there are no fishing banks where such food fish as cod and halibut live. But in the rivers, along the coast, and in the bays, are excellent food fish which are caught mainly for use in the South. One of the largest fishing companies has its headquarters at Galveston.

1. The oyster industry

Oysters are found in the bays all the way from Cape Cod to the Rio Grande; but one of the best places for them is Chesapeake Bay, where the waters are warm, shallow, and quiet. From this broad, branching bay they are collected in great quantities, some being shipped away fresh in the shell, while many are canned, like fruit. BALTIMORE and NORFOLK are especially noted for this industry.

There is also extensive oyster fishing in the shallow bays, as in Mobile Bay, for instance; and in southern Florida there is sponge and turtle fishing. The sponge grows in the warm, shallow waters of the coral reefs; and the immense sea turtle swims about on the surface of the ocean. The alligator, whose skin is made into the valuable alligator skin leather, is also found in Florida.

Mining

1. Coal and iron

There is a great variety of minerals in the South; but here, as in the North, the most important of all are coal and iron ore. One fourth of the coal of the country, and about one ninth of the iron ore, now come from the states south of Pennsylvania.

Coal and iron ore are found among the mountain ranges, and in the Appalachian Plateau, all the way from Pennsylvania to Alabama. In coal production Pennsylvania and West Virginia lead the other states and while each state produces much iron there is not enough for the local demand, so by shipping iron ore from the iron mines in Michigan and other states they maintain an extensive industry in steel and iron. Both coal and iron are mined in several places, as near CHATTANOOGA in eastern Tennessee; but most noted of all is the district around BIRMINGHAM, Ala., near the extreme southern end of the Appalachian system. This region is so rich in coal and iron that it now ranks as the second iron-producing section of the continent; and in coal production Alabama ranks fifth among the states of the Union. The Birmingham region is especially favorable because iron ore, coal, and limestone, the three materials necessary for the production of iron and steel, are found there close together.

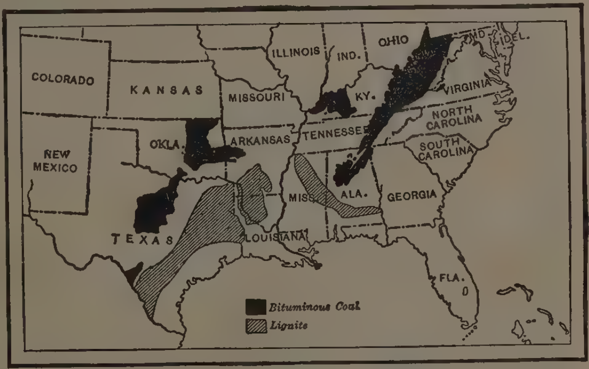


FIG. 74. — The coal fields of the Southern States.

Coal is obtained not only in the Appalachian Mountains and Plateau, but in central Texas, Oklahoma, and Arkansas. There are also iron ore and other minerals here. Beneath the plains bordering the Gulf of Mexico, from the Rio Grande to Georgia (Fig. 74), there is much brown coal, or lignite. This is not so good as the bituminous coal of the Appalachians, but it is valuable, and can be used for many purposes.

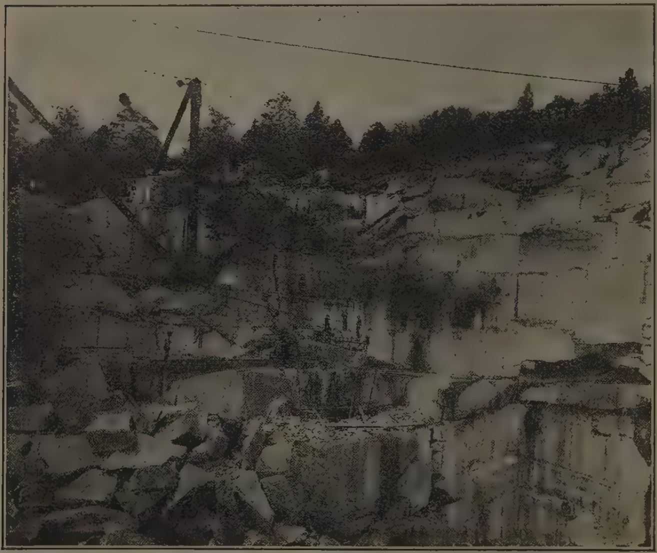


Fig. 75. — A marble quarry near Knoxville, Tennessee.

2. Oil and gas

There is not much natural gas produced in the Southern States, though it is found in several of them. The greatest quantity comes from Oklahoma. Petroleum, however, is of very great importance. Vast quantities have been found in Oklahoma and Texas, and in Louisiana, and this is now one of the most noted oil regions in the world. Millions of barrels of oil are produced there every year. Much is also found in West Virginia, and some in Tennessee.

3. Building stones and clays

There are valuable deposits of granite in several of the states, especially North and South Carolina, Georgia, Arkansas, and Texas. Excellent sandstone for building, and limestone for various uses, are also widely distributed. Among the important uses of the limestone here, as in the North, is the manufacture of Portland cement.

There is much beautiful marble in Texas, Georgia, and Tennessee. The Georgia marble is widely known for its great beauty; and near KNOXVILLE, in eastern Tennessee, marble of different colors is quarried (Fig. 75). What city in Vermont is likewise noted for marble (p. 33)?

Clays of fine quality for bricks, tiles, etc., are found in many places.

4. Phosphates

The soil of farms often becomes worn out and needs a fertilizer. There are various kinds of fertilizers, such as manure and bone dust, which furnish the plant food needed by crops; but one of the most important kinds is *mineral phosphate*. This is found in great quantities in Florida, Tennessee, and South Carolina; and from these states much phosphate is now obtained. Besides being used in the South, it is shipped from CHARLESTON, JACKSONVILLE, and TAMPA for use on farms in the North.

The phosphate comes largely from the remains of animals, such as the teeth of sharks, and the bones and teeth of larger land animals that lived in this country in former ages.

5. Other mineral products

The South produces a variety of other minerals. Salt, for instance, is obtained in Texas and Louisiana. Bauxite, the mineral from which aluminum is made, is found in Georgia and Alabama. Gold is mined in South Carolina, Georgia, and Tennessee; silver in Texas and South Carolina; and copper in Tennessee. Some precious stones, such as the sapphire and the diamond, are also found. The South is, therefore, a rich mineral region, and mining is rapidly growing in importance.

Manufacturing

1. Great advances in this industry

Before 1860 there was little manufacturing in the South. The negroes, who did most of the hand labor, lacked the training necessary to handle machinery. The raw materials were shipped away, and the manufactured articles were brought back. Thus cotton went to England, New England, and elsewhere, some of it to be returned in the form of cloth; and lumber was shipped to various Northern cities, often to be sent back in the form of furniture. Very little iron ore or coal was mined in those days.

The situation is now greatly changed. Indeed, the advance made in manufacturing since 1860 has been wonderful.

The raw materials are very abundant, and of many kinds, as we have seen. Name some of them. Most of these raw materials must be changed more or less for use, and this calls for manufacturing. There is a great abundance of coal, to furnish power for such work; and there is also much water power along the Fall Line, in the Piedmont Plateau, and among the mountains. The conditions here are very favorable, therefore, for manufacturing. Why, then, should these raw materials be sent far away to be manufactured?

This is a question that the Southern people have asked themselves; and they have answered it by the manufacture of many goods on a grand scale. There is every reason, too, to believe that this manufacturing will rapidly increase in the future, for the South has all that is necessary for very extensive manufacturing, and the people are awake to their opportunities.

2. Cotton manufacturing

(1) Extent of cotton manufacturing, and leading centers

In some cities there are many cotton mills; for example, in Charlotte, N.C., there are over twenty, and in and near Spartanburg, S.C., nearly forty. In many other towns there are one or two. From Danville, Va., to Atlanta, Ga., cotton mills are very numerous, and there are others throughout the cotton belt. Indeed, the Piedmont Plateau has become one of the greatest cotton-manufacturing sections in the world. The map (Fig. 76) shows the distribution of these mills in a number of the Southern States.

While hundreds of Southern cities and towns now manufacture cotton cloth and cottonseed oil, Charlotte, N.C., Columbia, Greenville, and Spartanburg, S.C., and Augusta, Columbus, and Atlanta, Ga., lead in these industries. What cities in New England are noted for cotton manufacture (p. 38)? Where does their raw cotton come from?

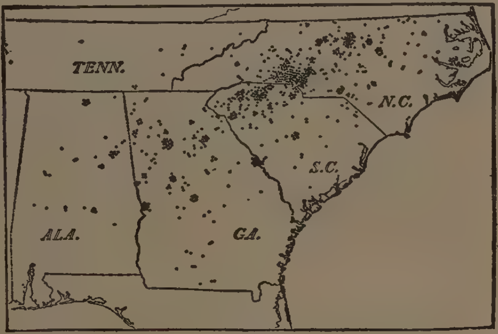


Fig. 76.—A map to show the extent of cotton manufacturing in the South. Each dot represents one mill.

(2) Meaning of a "mill"

The following facts from an Alabama cotton mill give some idea of the size and output of these mills. This particular mill employs 600 hands, including men, women, boys, and girls. Every day this mill consumes 15 bales of cotton, each weighing about 500 pounds. Since the average yield per acre of land is about 250 pounds, you can easily figure out how

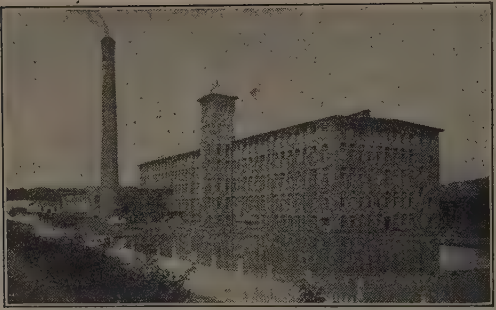


Fig. 77.—A cotton mill at Huntsville, Alabama. There are many others as large as this, and many, also, that are even larger.

many acres of cotton are required in one year to supply this single mill.

In this mill, as in many others, white people are employed to do the work. While many of the mills are in cities, others are in the country; and there villages have sprung up near the mills. Some of these new villages are already so large that they have their own schoolhouses and churches.

(3) *Value of the cotton gin*

In the early days the cotton seeds were slowly picked out of the cotton by hand and thrown away. Whitney's invention of the cotton gin, in 1793, made it possible for one laborer to separate as much as a thousand pounds from the seed in the same time that five or six pounds could be cleaned by hand. That, of course, made cotton raising far more profitable, and led the planters to raise more.

(4) *Value of cotton seed*

The seeds have also been found to be of value, and are no longer thrown away. Oil is pressed out of them, which is used in making soap, imitation lard and butter, and a substitute for olive oil. There are from two to three pounds of seed to one pound of cotton, and since, on the average, one acre produces two hundred and fifty pounds of cotton, the value of the cotton seed from a large plantation is not small. The part of the seed that is left, after the oil is pressed out, has been found to be an excellent food for cattle, and a good fertilizer. Thus the cotton plant now produces two valuable substances besides the cotton fiber.

3. Manufactures from the forest

Although much of the pine, oak, and other lumber is sent North, a great deal of it is made into doors, blinds, furniture, etc., at factories in Macon, Montgomery, Mobile, Chattanooga, Memphis, Little Rock, and Atlanta. Locate each of these cities. High Point, in North Carolina, "the Grand Rapids of the South," is now one of the most noted furniture manufacturing centers of the Southern States, although a few years ago it was hardly known. There are now eighty manufacturing plants there.

The Southern forests are of value in several other ways. From them are obtained *turpentine* and *tannic acid.* Turpentine is made from the sap of the long-leafed

Fig. 78.—Interior of a cotton mill in the South. There are scores of machines, and each one works steadily weaving the cotton fiber into cloth.

pine. The bark is cut through near the base of the tree, when the liquid from which turpentine is made oozes forth. Other products from the pine are rosin, tar, and wood alcohol.

4. Iron manufacturing

As we have seen (p. 63), both coal and iron are mined extensively in the South and iron manufacturing is an important industry in this section. The leading centers are Birmingham, Baltimore, Wilmington, Del., Richmond, and Wheeling.

5. Other manufactures in the South

Some of the other articles manufactured in the South have already been mentioned; for example, tobacco (p. 60) and sugar (p. 58). In each case the work is confined mainly to the sections from which the raw material comes. Thus, New Orleans, near the sugar plantations, has large sugar refineries. Raleigh, Durham, and Winston-Salem, in North Carolina, Louisville, in Kentucky, and Lynchburg, Danville, and Richmond, in Virginia, manufacture tobacco. Tobacco is easily obtained from Havana, Cuba, and manufactured extensively at Key West and Tampa.

Transportation

1. Harbors

There are good harbors along the Southern coast, although they are not as numerous as they are farther north. Much of the coast line is too straight to form harbors; and many that might otherwise be excellent are too shallow to admit large vessels.

The most irregular coast is in the northern part, and there good harbors are most numerous. Trace the boundaries of Chesapeake Bay and note the important cities located upon it. Locate Delaware Bay. Judging by the size of the coast cities, what other ports seem to be important? Our national government spends large sums of money each year caring for these harbors, — building jetties, dredging the sand away, and making their approaches safe. Three of the seven leading ports of the United States are located in the Southern States. They are New Orleans, Galveston, and Baltimore. The opening of the Panama Canal has given to these ports greatly increased opportunities for trade. Trace on the map (Fig. 446) the course that a ship may follow in sailing from New Orleans to San Francisco by the Panama Canal.

2. Rivers

The rivers play a very important part in transportation in the Southern States. The most important, of course, is the Mississippi River. With its tributaries it provides means of transportation for an enormous region. By what water route can Richmond, Va., be reached? Washington, D.C.? Philadelphia? On Fig. 215, note the number of rivers in these states that are navigable. How far northeast can goods be carried on the Mississippi and its tributaries? How far northwest? What advantages of location does New Orleans enjoy? Why should it not be even as great a city as New York?

Fig. 79. — A planing mill in eastern North Carolina. Notice the great piles of boards in the yard behind the mill.

3. Railroads

On page 180 are shown the railroads in these states. All important points have many connections with one another by rail. Among these are some of the leading railways of the country. The Southern, the Southern Pacific, the Baltimore and Ohio, the Louisville and Nashville, the Seaboard Air Line, the Atlantic Coast Line, the Central of Georgia, the Rock Island, the Chesapeake and Ohio, the Illinois Central, and the Santa Fé may be mentioned here. Trace the principal trunk-line railroads on the railroad map (Fig. 217). What railroads pass through your home city?

Baltimore and vicinity

(1) An important seaport

BALTIMORE is the largest city in the Southern States, and the seventh city in population in the United States. Situated near the head of Chesapeake Bay, it has an excellent harbor and a favorable location for trade. Indeed, with steamship lines to other seaports by the Atlantic coast, and to Europe, South America, the West Indies, and Panama, Baltimore is one of the great seaports of the world.

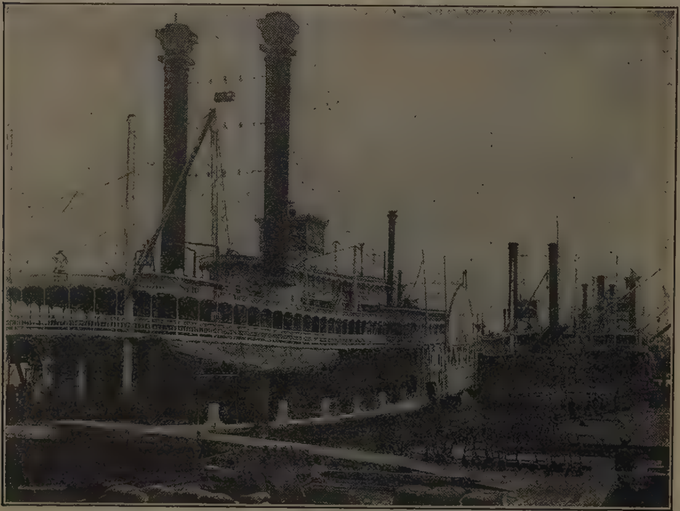


FIG. 80. — River steamers at New Orleans. These boats carry large amounts of freight, as well as passengers, up and down the river.

(2) A railroad center

This city is also one of the greatest railroad centers of the south. At terminals of the Baltimore and Ohio, the Pennsylvania, and the Western Maryland railroads, an unending line of trains is continually unloading grain, cotton, coal, and fertilizer, to be shipped by rail or steamship all over the world. The location of the city so far from the coast gives to the city the advantage of being near to the sources of raw material. How does Baltimore resemble New York in this respect? Boston?

(3) Manufacturing

Baltimore is a great manufacturing city. Within the city limits there are over twenty-five hundred manufacturing establishments, and just outside the city limits there are many more. The annual value of the products of these industries is nearly $200,000,000.

(4) Power for manufacturing

In the development of these manufacturing industries, Baltimore has always been able to obtain power easily from falls within the city limits and from the coal of western Maryland. Within recent years electrical power has been developed near the mouth of the Susquehanna River. This power is sufficient to furnish much power for manufacturing and transportation purposes in the city.

(5) Provisions for health

Baltimore is a beautiful city. The streets are wide, clean, and well paved. The industrial buildings, especially those occupied by large manufacturing companies, are well lighted and sanitary. The homes of the city are well built, with plenty of open space for air and light.

Baltimore is the seat of Johns Hopkins University; and a few miles south, at ANNAPOLIS, is the United States Naval Academy, which prepares officers for the navy, as West Point prepares them for the army.

Wilmington

WILMINGTON, on the Delaware River, is the largest city in Delaware. It is noted especially for shipbuilding, the manufacture of cars and heavy machinery. It is associated with Baltimore and Philadelphia as an important manufacturing center.

Southwest of Baltimore, on the Potomac River, is the District of Columbia, where

District of Columbia

WASHINGTON, our national capital (Fig. 81), is situated. This site was chosen for the capital long ago, when this was near the center of the settled part of the country. On Figure 183 you will find a star showing where that center is now. The District of Columbia does not form a part of any state, but is controlled directly by the national government.

Washington is unlike other cities in two respects. In the first place, since it was certain that it would one day be very large, it was carefully planned, with wide streets and many parks. For that reason it is more beautiful than most cities. In the second place, the people, unlike those of other large cities, are not chiefly interested in manufacturing and commerce. Here reside the President and his cabinet, members of Congress, and the foreign ambassadors and other representatives of the great nations of the world. Besides these there are many thousands of men and women at work in the different departments of the government. The chief buildings, therefore, are not factories and private offices, but government buildings (Fig. 81).

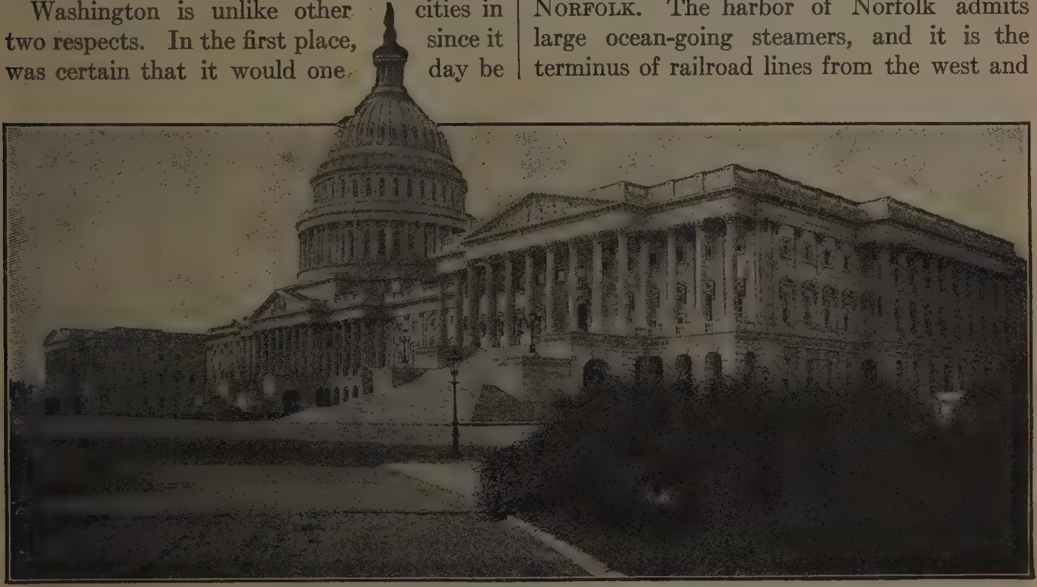


FIG. 81. — The National Capitol Building at Washington.

Cities of Virginia

1. Norfolk and vicinity

Just at the mouth of the James River is Hampton Roads, said to be the finest landlocked harbor on the eastern coast of the United States. On the peninsula that projects north of this harbor are OLD POINT COMFORT with its huge hotels, FORTRESS MONROE, and NEWPORT NEWS; and on the opposite side are PORTSMOUTH and NORFOLK. The harbor of Norfolk admits large ocean-going steamers, and it is the terminus of railroad lines from the west and south, which has made it a great shipping point for coal, cotton, lumber, tobacco, vegetables, and other products. Norfolk is also connected by navigable waters with Richmond, with Baltimore, Washington, and other cities on the Chesapeake, by canal through the Great Dismal Swamp southward to Pamlico and Albemarle sounds, and with all the cities of the Atlantic coast and of Europe by the ocean. At NEWPORT NEWS there is one of the great shipyards for the building of ocean steamers and war vessels, supplied also with dry docks for the overhauling of great ships.

Up the James River a few miles is the site of Jamestown, where the early colonists struggled for the first permanent foothold in the United States, and where John Smith showed himself so daring and prudent in providing for the settlers. Just to the north of this deserted place is WILLIAMSBURG, famous during colonial days as the capital of Virginia. Across the peninsula on the York River is YORKTOWN, where Cornwallis surrendered.

2. Richmond and vicinity

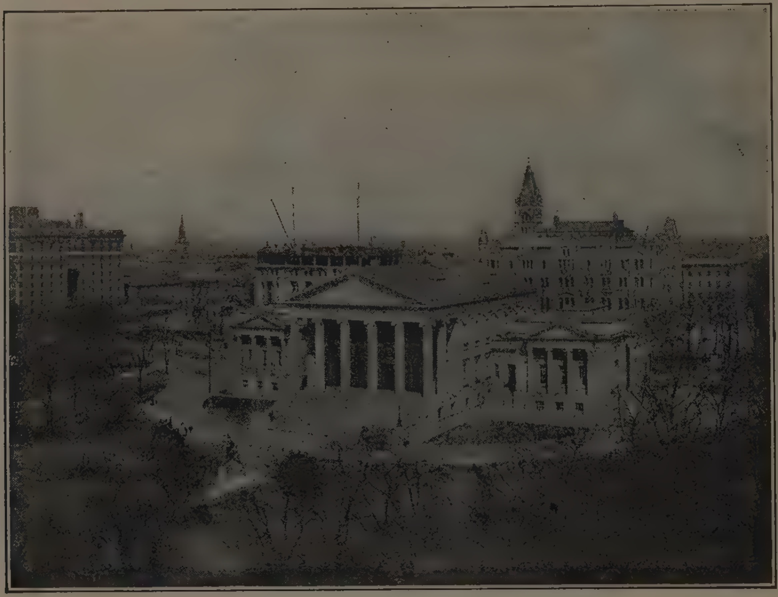


FIG. 82. — A view of Richmond, showing the capitol.

Nearly 200 miles from the mouth of the James River is the city of RICHMOND. It is finely situated in a group of hills at the upper edge of the tidewater region. This elevation gives to the city a healthful location. Where the James River flows over the rocks from the Piedmont to the Coast Plain considerable water power has been developed and has for many years been used by the flour mills at this point.

Richmond is an important railroad center with branches extending to the cities of the coast and to the various cities in the interior. From the fertile agricultural section of Virginia and Maryland tobacco is shipped into the city, and from the states farther south it receives large shipments of cotton. The chief manufactured articles are tobacco, flour, and shoes.

The old capitol building, located in a park in the center of the city, and the famous statues of Washington and Stonewall Jackson, are objects of interest to every visitor. What interesting historical facts can you mention about the city of Richmond?

Wilmington, Charleston, and Savannah

The other Atlantic coast cities are chiefly engaged in shipping cotton and lumber, and most of them are located near the mouths of rivers, so that these goods may be brought to them by water as well as by rail. In these cities there is important manufacturing, especially of cotton goods and lumber.

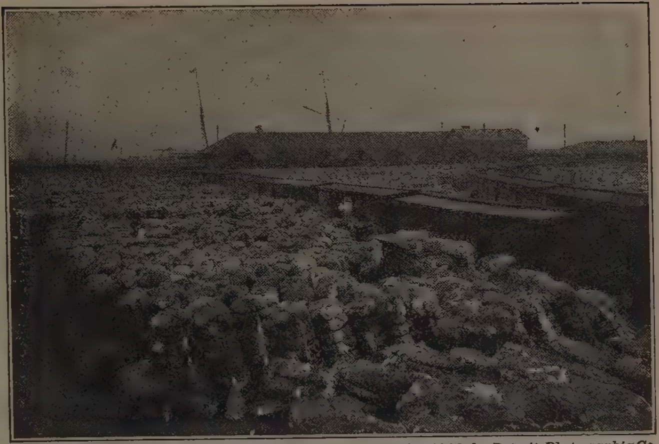
WILMINGTON is the largest and most important port in North Carolina. It is an important railroad center. The principal manufactured articles are lumber products, cotton goods, machinery, and fertilizers.

Two of the best-known seaports are CHARLESTON and SAVANNAH, both long noted as shipping points for cotton (Fig. 83), lumber, and other goods. Charleston is one of the leading lumber ports in the South. From what section does the lumber come to these ports?

A number of the important cities of North Carolina have developed in the interior of the state. They are RALEIGH, DURHAM,

Other cities of North Carolina and South Carolina

GREENSBORO, WINSTON-SALEM, and CHARLOTTE. All these cities are in a fertile agricultural region. Tobacco and cotton are raised in abundance. The principal manufacturing in these cities is connected with these industries. Charlotte is the largest city in North Carolina, and Raleigh is the capital. The climate of North Carolina in the Piedmont and among the mountains is extremely healthful and invigorating. For this reason this region is a popular health center for all seasons. Asheville is one of the most noted health resorts in the country.



Copyright, 1900, by Detroit Photographic Co.

FIG. 83. — Thousands of bales of cotton on one of the wharves at Savannah, ready for shipment.

COLUMBIA is the capital of South Carolina and the second largest city in the state. It is located on a branch of the Santee River on the Fall Line (Fig. 58), at the head of the navigation. Power for manufacturing purposes is developed here. Cotton manufacturing is an important industry. In the western part of the state SPARTANBURG and GREENVILLE are two rapidly growing cities.

Atlanta and other cities in Georgia

ATLANTA, the "Gate City," is one of the few large cities not located upon a water route. Northeast of it, for over 350 miles, there is no easy pass across the mountains, and until 1880, in all that distance, no railway crossed the Appalachian Mountains. Railroad communication between the Southern States, east of the Appalachian Mountains, and the states in the lower Mississippi Valley and the West, was made possible by building railroads along the Piedmont Belt and around the southern end of the Appalachian Mountains. Atlanta is situated on a direct line of communication between the eastern and western states of the Southern section. It is also advantageously located at the foot of the Appalachian Mountains, and from here railroads have been built into the valleys and through

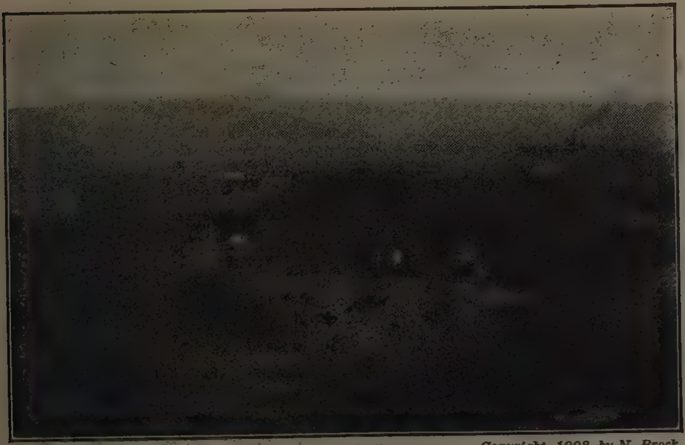


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FIG. 84. — Asheville, situated in a valley among the high mountains of western North Carolina.

the passes of these mountains. Atlanta has thus become a great railway center with lines reaching out to the seaports on the Atlantic Coast and the Gulf and to the interior cities in the Mississippi Valley in the West.

Owing to its favorable situation as a railway shipping point, Atlanta is the leading interior wholesale market of the South. The trade that it carries on with these states brings enormous quantities of raw materials which are made into manufactured goods in the city. The manufactured articles are lumber, cotton, and iron products. Much of the power for this manufacturing is obtained from hydro-electric plants, built many miles away on the Chattahoochee, the Tennessee, and other rivers.

In northwest Georgia there are a number of thriving cities engaged in the coal and iron industries. Chief among these is ROME, which is situated in the mountainous region. In the central part of the state, in a section noted for its timber and agricultural resources, are AUGUSTA, MACON, and COLUMBUS. These cities are located on rivers where they cross the Fall Line. In these cities water power and electric power have been developed and are used for manufacturing purposes. The chief manufactured articles are textiles, made from cotton raised in the vicinity, woodwork from the timber resources, and steel and iron utensils from the iron mills.

Other interior cities of Georgia

BIRMINGHAM, in northern Alabama, is the center of the coal and iron industries of the South. From the mines in the vicinity it secures the raw material for its furnaces, rolling mills, steel mills, and machine shops. Three quarters of the Alabama iron ore is obtained from the Birmingham districts. So extensive are its iron and coal interests that it has been called "The Pittsburgh of the South." Thousands of skilled workmen residing in the city are employed in making steel and in the manufacture of steel products. Describe the process of making steel (p. 37).

Birmingham and Montgomery

Birmingham is a very important railroad center. It has railroad connections with the leading cities and seaports of the South.

In the central part of Alabama, on the Alabama River, is MONTGOMERY, the capital of the state, and the first capital of the Confederacy. It is situated in a fertile agricultural region in which cotton, grain,

FIG. 85. — A view of Atlanta.

fruit, and tobacco are raised in abundance. Steamboats on the Alabama River and railroads connect the city with Mobile.

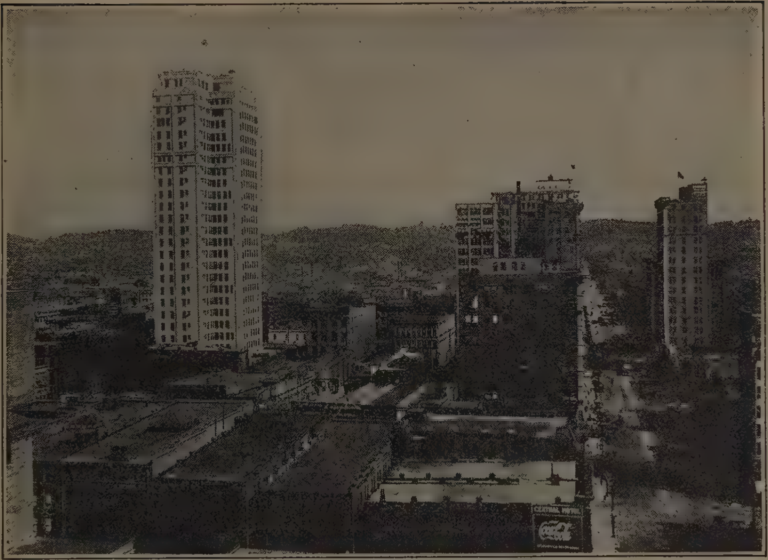


Fig. 86. — A view of Birmingham.

Cities of eastern Florida

Jacksonville is the largest city and the commercial center of Florida. It is situated on the St. John's River, about fourteen miles from the mouth. This river is navigable for large steamers not only to Jacksonville, but for a distance of two hundred miles above the city. Jacksonville is a busy shipping center for cotton, fruits, and fertilizers. The principal industries are shipbuilding, and iron and steel manufacturing.

On the east coast of Florida, near its southern extremity, is the seaport of Miami. There are also numerous resorts for health and recreation, along the eastern coast. Palm Beach is the most noted. What other health resorts on the Atlantic coast can you mention?

New Orleans

(1) *Size and location*

New Orleans, one of the great cities of the United States, is the largest city of the Gulf States. The city is situated on the Mississippi River about one hundred miles above the mouth of the river, on an arm of the Gulf of Mexico called Lake Pontchartrain, at the place where the river and the lake are nearest together. Where the river passes the city, it makes a great bend to the south in the form of a half circle, so that the city is built in the form of a crescent. It is on this account that New Orleans is frequently called the *Crescent City*.

This particular location was selected for the site of the city, because the sailing ships of two centuries ago could reach it by crossing the lake, although they could not sail a hundred miles up the river without great difficulty. On account of the shallow water, the large ocean steamers now in use cannot enter the lake, but they can reach the city by the river route.

(2) *Interior connections by rail and water*

When we recall the advantages for trade and commerce that New York City possesses because of its water connections with the West, we can readily understand why New Orleans is a great commercial city. New Orleans is situated in the main waterway of the greatest and most productive valley in North America. Pittsburgh on the Ohio, St. Paul on the Mississippi, and Kansas City on the Missouri, can all be reached from New Orleans by boat. Like New York, New Orleans is connected with the interior of the country by rail as well as by water. Through the Illinois Central, the Louisville and Nashville, the Southern Pacific and

Fig. 87. — Lafayette Square, New Orleans.

many other railroads, every section of the country can be reached.

(3) *Its ocean trade*

For commerce with ports on the Atlantic and Pacific coasts and with the ports on the Gulf of Mexico, New Orleans occupies a favorable position. The Panama Canal has increased this trade and opened the way for trade with the western ports of North and South America, with the islands in the Pacific, and with the distant countries of Asia.

(4) *Rank in commerce*

The advantages which New Orleans possesses for commerce with the markets and ports of the United States, and with the ports of other countries have made it possible for the city to attain in 1914 second rank in total commerce among the cities of the United States. It is the largest cotton market in the United States, and exports, in addition to cotton, sugar, rice, lumber, grain, and tobacco.

(5) *Manufacturing*

New Orleans is not only a great commercial center but an important manufacturing center also. Sugar refining is the principal industry.

Other Gulf ports

Mobile, the chief seaport of Alabama, is situated on the Mobile River at the entrance to Mobile Bay. It is the leading city of the state, and one of the important cotton markets in the United States. It has gained its important position in commerce because it is the natural outlet of one of the great cotton regions in the United States. This city is the center of a large trade with the Gulf cities.

In Florida are Tampa and Pensacola, both with excellent harbors, and both rapidly growing cities. Besides its cigar manufacturing (p. 67), Tampa has a growing trade with the West Indies. It is the terminus of important railways, and is the nearest port on the mainland in the country to the Panama

By courtesy of Mississippi River Commission.

Fig. 88. — The embankment, or levee, along the Mississippi, built to prevent the river from overflowing the flood plain.

Canal. Owing to the canal, the trade of both Pensacola and Tampa has already greatly increased.

KEY WEST, the most southern seaport in the United States and the nearest to the Panama Canal, is situated on a small island of coral formation, about one hundred miles southwest of the mainland of Florida. The island has been made into a safe harbor, defended by a fort with modern fortifications. Tobacco manufacturing is the most important industry. The city is connected by a railroad running over the Florida Keys to the mainland.

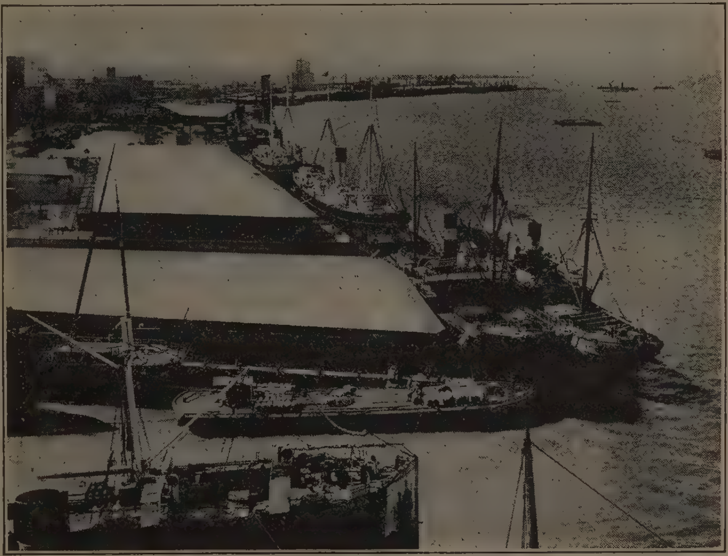


FIG. 89. — A view of the harbor, Galveston.

Galveston

(1) *Importance as a seaport*

The most important seaport on the Gulf is GALVESTON. In the value of its exports it ranks next to New Orleans and is, therefore, the third seaport in importance in the United States. It has a splendid harbor protected by a great sea wall. At its docks ships from New York, New Orleans, Key West, Havana, Vera Cruz, and various ports in South America, Europe, and Asia unload merchandise for shipment across the continent to San Francisco and to various cities in Texas and Mexico. These ships go away loaded with great cargoes of cotton, wool, grain, fruit, and vegetables.

(2) *Importance as a railroad center*

Galveston is an important railroad terminal, bringing all the cities of Texas and the West in close communication with its port. There is also some manufacturing here, giving rise to iron foundries, machine shops, planing mills, vast grain elevators, and flour mills.

Other cities of Texas

(1) *Cities of eastern Texas*

The eastern part of Texas is a fertile agricultural section and very productive. For this reason many large cities of Texas are located here. Two of them are DALLAS and FORT WORTH — both shipping points, the former for cotton, the latter for cattle from the plains of the West. Dallas is also a busy distributing center for inland trade. AUSTIN, the capital, is on the Colorado River. SAN ANTONIO, the largest city in the state, lies farther southwest. It is noted for its mild winter climate. Thousands of people from the cold northern cities make this city a popular winter resort.

HOUSTON is the third city in size and the second in importance in manufacturing. It is also an important commercial center, being closely connected with the Gulf by the Houston Ship Channel. Houston is an important railroad center with railroads reaching out to every important city in Texas and the southwest.

EL PASO, the chief city of western Texas, is the most important railroad center in the Southwest. As its name indicates, it is a

Fig. 90. — The Alamo, at San Antonio — an old Spanish church, famous in the history of Texas.

(**2**) *Cities of western Texas*

pass in the mountains. Through this pass railroads radiate to the north, the west, and also into the interior of Mexico. It is situated convenient to a rich mining district. Large quantities of ore are shipped to the two large smelting plants that are located here.

Chief cities of Oklahoma

Although Oklahoma is new, there has already been great development of agriculture, oil and other industries, and no doubt there will be much greater advance in the next few years. The progress in manufacturing is indicated by the number and size of cities and towns that have already sprung up. The largest is the capital, Oklahoma City, but Muskogee, Guthrie, Tulsa, and Shawnee are also large and growing cities.

Memphis

Memphis is another large and rapidly growing southern city. It is situated in Tennessee, on a bluff, with the Mississippi River at its base. Why is that a favorable location for the growth of a large city? Memphis is the most important trading center for towns of Tennessee, northern Mississippi, and eastern Arkansas. It receives from these towns agricultural products and sends back to them manufactured articles and supplies. It is a railroad center, a noted river port, and one of the greatest cotton centers and lumber markets of the South. The principal exports are cotton, lumber, coal, and grain. In what respects are Memphis and Atlanta similar?

Cities in the lower Mississippi Valley

The great quantity of cotton raised in the lower Mississippi Valley requires a large number of interior cotton markets and shipping ports. Shreveport, Pine Bluff, Fort Smith, and Little Rock, on the tributaries of the Mississippi River, and Baton Rouge, Natchez, and Vicksburg, on the Mississippi River, are important centers for cotton, and distributing points for merchandise and manufactured articles used in this section. Many of these cities are interested also in sugar, lumber, grain, and fruits.

Louisville, the principal city of Kentucky, is beautifully situated on the rapids of the Ohio River about four hundred miles

Fig. 91. — A view of a part of Oklahoma City.

above its mouth. It has an extensive river front, affording ample space for the location of docks and warehouses. Steamboats on the Ohio connect this city with cities on the Mississippi River. The government is now busily engaged improving the facilities for transportation on the Ohio River above the city. When the present plans are completed, it will be possible for large boats to pass from Pittsburgh to Cairo and down the Mississippi. A canal around the falls of the Ohio permits steamboats to pass through the city.

Louisville and vicinity

FIG. 92. — A view of Memphis.

Louisville is located in the midst of a great agricultural region, and it is near to the mineral resources of the Appalachian Mountains. Tobacco is one of the principal products of the state, and Louisville is the center of the tobacco industry. It is the largest tobacco market in the world. The city is also an important manufacturing center.

FIG. 93. — A view of Louisville.

Its manufactured products are tobacco, liquors, dressed meats, agricultural implements, and clothing.

Lexington, whose population is 35,099, is an agricultural and stock-raising center.

In the central part of Kentucky, pleasantly situated on the Kentucky River, is FRANKFORT, the capital of the state. The bluegrass region, a remarkably fertile agricultural section, lies to the east of this city. Frankfort is, therefore, interested in agriculture and stock raising. Considerable manufacturing is also done in this city.

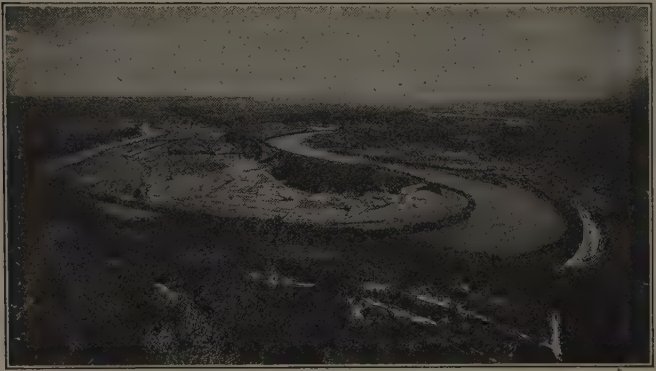


FIG. 94. — Moccasin Bend in the Tennessee River, as seen from Lookout Mountain. Chattanooga is situated on the river bank just to the right of the middle of the picture.

West Virginia cities

WHEELING, West Virginia, has a fine situation on the Ohio River. It is the largest city in the state and the most important city on the Ohio River between Pittsburgh and Cincinnati. In the vicinity of Wheeling there are extensive coal beds. Because fuel is cheap here, large manufactories have been built. The principal manufactured articles are iron and steel products, pottery, and flour. Farther down the river, about halfway to Louisville, is HUNTINGTON, a manufacturing city and a shipping point of considerable importance.

Nashville, Knoxville, and Chattanooga

If we recall the roughness of the plateau west of the Appalachians, we can understand the reason for the location of CHATTANOOGA. It is on the Tennessee River (Fig. 94), at a point which makes it a gateway somewhat like Atlanta. There is much manufacturing here, especially of articles made of iron and wood. Another busy manufacturing city near by is KNOXVILLE, which is not quite so large as Chattanooga.

NASHVILLE, the capital of Tennessee, has sawmills, furniture factories, and flour mills. There are more than six hundred factories in this city. It is in the midst of a splendid farming country, and is a distributing point for supplies to the surrounding towns and farms. It is also one of the educational centers of the South, having Vanderbilt University, George Peabody College for Teachers, and other important schools. There are several other well-known universities in the South, and each state supports a state university. Many of these take a high rank among the universities of the country.

Review Questions

1. What states are included in this group? 2. What can you say about their area and population? 3. Name and locate the principal mountains. 4. State the principal facts about the Coastal Plain. 5. The Piedmont Plateau. 6. The Fall Line. 7. The other plains found in these states. 8. The coast line. 9. Describe the climate. 10. How does agriculture rank in comparison with the other industries? 11. Give facts showing the importance of the cotton crop. 12. What is the method of raising and marketing it? 13. Tell about the sugar industry. 14. Rice. 15. Tobacco. 16. Other farm products. 17. Live stock. 18. Lumbering. 19. Kinds of fishing. 20. The oyster industry. 21. What about coal mining? 22. The production of iron ore? 23. Oil and natural gas? 24. Building stones and clays? 25. Phosphates? 26. State the advances recently made in manufacturing. 27. How are conditions very favorable to manufacturing? 28. Show the extent of cotton manufacture. 29. Explain the value of the cotton gin; of the cotton seed.

30. Give some idea of the importance of iron manufacture, and name some of the principal centers for such work. 31. State similar facts in regard to manufactures from the forest. 32. Name and locate other kinds of manufacturing in these states. 33. What advantages for transportation of goods does the South enjoy? 34. Recall the leading facts about Baltimore. 35. Washington and District of Columbia. 36. Cities of Virginia. 37. What are the principal industries of Charleston, Savannah, and Wilmington? 38. Name the other important cities of North and South Carolina. 39. What advantages does Atlanta possess for trade? 40. Name other cities of Georgia. 41. For what is Birmingham noted? 42. Locate Montgomery. 43. Name the cities on the western coast of Florida. 44. What is the capital of Florida? 45. Recall the leading facts about New Orleans. 46. Name the Gulf seaports. 47. For what is Galveston noted? 48. Name the other important cities of Texas. 49. Of Oklahoma. 50. Why is Memphis an important city? 51. Name the cities in the lower Mississippi Valley. For what is each noted? 52. Why is Louisville an important city? 53. Locate Frankfort. 54. What are the principal industries of Wheeling and Huntington? 55. Give some facts about Nashville, Knoxville, and Chattanooga.

Review Questions by States

Delaware (Del.). 1. Which is the principal city in this state? 2. For what is it noted? 3. Why is it especially well situated for that industry? 4. The principal industries of the state are fruit raising and farming. What two reasons can you give for this fact?

Maryland (Md.). 5. In which section is farming most important? Why? 6. What products can you expect from the mountains? Why? 7. Notice how branching Chesapeake Bay is. Why is it so irregular? 8. What influence must this have upon the number of oysters found there? 9. Why is Baltimore favorably situated for receiving coal and iron from Pennsylvania? 10. For canning fruit, vegetables, and oysters? 11. Compare the size of Baltimore with that of Boston.

Virginia (Va.). 12. Locate the fertile Great Valley that is found in Virginia. 13. What kinds of agriculture are carried on here? 14. What river separates Virginia from Maryland? What river crosses the middle of Virginia? 15. How does Virginia rank in iron production (Fig. 206)? 16. Of what importance are the branching bays that enter Virginia? 17. If goods are to be shipped across the ocean from Kentucky (see map, Fig. 59), is it nearer to send them to Norfolk or to New York?

West Virginia (W. Va.). 18. What disadvantage is it to this state that it has no seacoast? 19. How could we reach the ocean by water from West Virginia? 20. Where is the largest city? Why there? 21. How does this city compare in size with Pittsburgh? 22. Should you expect to find much forest in this state? Why? 23. Much farming? 24. Coal, iron, petroleum, and natural gas are found here. Of what value are these?

North Carolina (N.C.). 25. Which part is mountainous? Name and locate the highest peak east of the Mississippi River. 26. What are the surface features of this state? 27. Which cities are mentioned in the text? Where is each? For what is each important? 28. What capes do you find on the coast? 29. What are the leading industries? (See Figs. 186–219.)

South Carolina (S.C.). 30. Describe the surface features of the state. 31. What are the principal industries? 32. What city is on the Fall Line? On the seacoast? For what is each important? 33. Which city is largest?

Georgia (Ga.). 34. Where are the mountains? 35. The plains? 36. What are the industries? 37. Trace the Fall Line across the state (Fig. 58). What cities are on it? 38. Why is Atlanta situated where it is? 39. How does it compare in size with the largest city in each of the three states just mentioned? 40. How does it compare in size with Louisville, Buffalo, and Providence? 41. Name the two seaports. What do they ship?

Florida (Fla.). 42. Explain the irregular southern coast and the Florida Keys. 43. Describe the climate. How does this influence the crops? 44. What Florida cities were mentioned, and how is each important? Locate each. 45. What mineral product comes from Florida?

Alabama (Ala.). 46. Trace the Fall Line across this state. What cities are situated on it? 47. Where is Mobile? How is it important? 48. Describe the location and industries of Birmingham. 49. What crops are raised in Alabama? 50. What cities are engaged in manufacturing cotton? 51. What cities are engaged in lumber manufacturing? 52. Compare Mobile in size with Atlanta and Birmingham.

Mississippi (Miss.). 53. Why is there no large city on the coast? 54. In what way can the products of the state be shipped by water? 55. From what cities? 56. What are the products? 57. Why no mining? 58. What about the extent of cotton raising in this state (Figs. 190, 191)?

Louisiana (La.). 59. State the reasons for the great importance of New Orleans. 60. Why has it a better location than Mobile or Charleston? 61. Compare it in size with those cities. 62. With Boston and

Baltimore. 63. What large tributary enters the Mississippi in Louisiana? 64. What crops are raised in Louisiana? Why there?

Texas (Tex.). 65. Where are the mountains? 66. Where are the forests? Why there? 67. What are the industries on the western plains? 68. What city lies in the western part? Why there? 69. What cities are in eastern Texas? 70. For what is Galveston noted? 71. Compare it in size with New Orleans and Charleston. 72. Texas is how many times as large as Pennsylvania? (For area, see table in Appendix.) 73. Add together the areas of all the Northeastern States, and compare the total with the area of Texas. 74. Compare the population of Texas with that of Massachusetts. (See Appendix.)

Oklahoma (Okla.). 75. What about the climate of the western part? 76. What crops are raised here? 77. Into what river does the state drain? 78. Name and locate the chief cities.

Arkansas (Ark.). 79. What large river enters the Mississippi in this state? 80. There is much forest in Arkansas. In what part? 81. Is Arkansas in the cotton belt? (See Fig. 190.) 82. The capital is the largest city. Compare it in size with Memphis. Why is it less favorably situated than that city?

Tennessee (Tenn.). 83. Where are the mountains? The plains? 84. Name two cities among the mountains. For what is each important? 85. State facts about two other cities in Tennessee. 86. Which city is the largest? (See Appendix.) 87. What large rivers drain the state? 88. What are the leading industries in this state?

Kentucky (Ky.). 89. Why should this state be better adapted to tobacco raising than Ohio? 90. Of what importance is the limestone of Kentucky? 91. Where are most of the cities? Why there? 92. What products from Kentucky are mentioned? 93. Which is the largest city? For what important? 94. What other cities are mentioned?

Suggestions

1. Draw an outline map of these states. Add the principal rivers and cities, and the state boundaries. 2. Represent this group of states in sand, showing the mountains and plains. 3. Make a collection of articles manufactured from cotton, and add them to the school collection. 4. Make a collection of different kinds of wood grown in the Southern States. 5. Raise some cotton and rice in the schoolroom. 6. Name other advantages that the mild climate of the South brings; for instance, in regard to clothing; coal for heating houses; and kinds of houses. Do you see any disadvantages in such a climate? 7. How are the people of New England and those of the South dependent upon each other in the work they do? 8. What two letters stand for *District of Columbia?* 9. Name and locate the capital of each state in the Southern group. 10. Write the abbreviations for each of these states.

5. Central States

Map study

1. Name the large rivers of this group. 2. Draw a sketch map showing them. 3. Into what ocean does the Red River of the North flow? 4. Sketch the five Great Lakes. 5. Locate upon each of these sketches the cities printed in large type. 6. Are any of the very large cities in these states not situated on rivers or lakes? 7. How far did the glacier advance in these states (Fig. 12)? 8. In what ways must the Great Lakes have influenced the development of this region? 9. Where are mountains found in these states? 10. What does the fact that there are so many rivers tell about the rainfall?

Surface features

1. Extent of level land

A little over a hundred years ago, when the pioneers had pushed across the Appalachian Mountains into Ohio, they were gladdened by the sight of immense tracts of level land (Fig. 95). For hundreds of miles the plains slope gently toward the Mississippi; and beyond that river, they slowly rise again, for hundreds of miles, to the very base of the Rocky Mountains.

In western South Dakota and in southern Missouri, low mountains rise above the plains. There is a hilly region around the western end of Lake Superior, in Michigan, Wisconsin, and Minnesota; and in eastern Ohio there is also hilly land, for the Appalachian Plateau extends into these states. With the exception of these small areas of mountains and hilly lands, most of the region is a vast level tract, quite unlike the hilly and mountainous country farther east. What are the names of the mountains of the Central States?

2. Absence of trees and bowlders

The hearts of the pioneers were gladdened not only because the land was level, but because a large part of it was free from forests and bowlders. In many sections of New England weeks of hard labor were required to remove the trees from a single acre, and to drag away or bury the bowlders. On the prairies of the Central States, however, such labor was unnecessary, for there were hundreds of thousands of square miles covered with grass (Fig. 95).

Climate

1. The temperature, with reasons for the extremes

Being so far from the coast, this region is not influenced by sea breezes, as are some of our states. Florida, for example, being nearly surrounded by water, receives breezes from the ocean that greatly temper the heat of summer. Similar breezes greatly temper the cold in winter, for the ocean does not become so cold as the land. Thus water makes the temperatures of the two seasons more nearly equal, or *equalizes* it. For that reason such a climate is said to be *equable*.

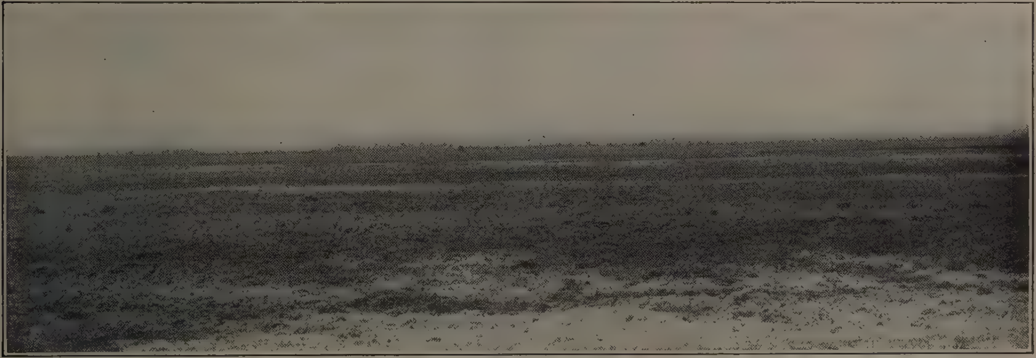


FIG. 95.— A view on the level plains of the Mississippi Valley. For hundreds of miles there is just such level land as this.

Because the Central States are so far from the ocean, the summers are very warm, while the winters are very cold. It is often as hot there in summer as it is in the Southern States; but in winter the coldest part of our country is in North Dakota and Minnesota. Such a climate, with hot summers and cold winters, is common in the interior of continents and is, therefore, called a *continental* climate. It is also said to be *extreme*, in distinction from a climate that is equable.

The Great Lakes are such large bodies of water that they influence the climate near them much as the ocean does, only to a less degree. Thus the climate is cooler in summer, and warmer in winter, along the shores of the lakes, than at a distance from them.

2. The fall of rain, with reason

Since these states are so far from the ocean one might suppose that they would receive little rain. This is true of the western part of Kansas, Nebraska, and the two Dakotas, where the climate is arid. The reason for this arid climate has already been stated. With the exception of the western border, however, the Central States have ample rain for farming, as is indicated by their many rivers. This rain is brought from the Gulf of Mexico and the Atlantic Ocean by the winds which every few days blow from the south and east.

Agriculture east of the arid lands

1. Its importance

From eastern Ohio to western Nebraska, and from the Great Lakes to the Gulf of Mexico, agriculture is a very important industry. Indeed, millions of persons in Europe and in our coast cities look to the Mississippi Valley for their bread, meat, and other food, as they look to the South for cotton.

The farms vary greatly in size, from a few acres to several thousand, but the majority

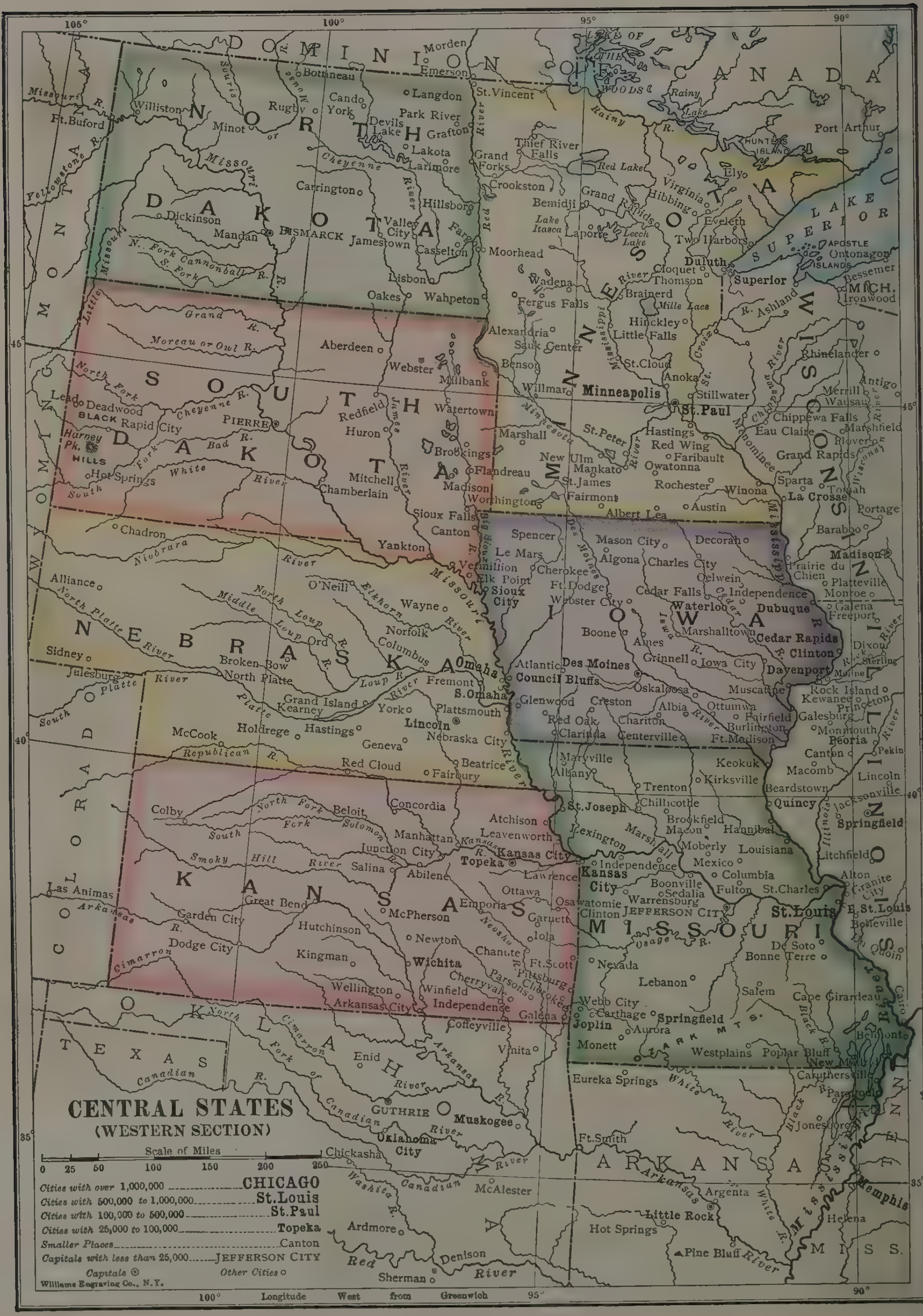

CENTRAL STATES
(WESTERN SECTION)
Scale of Miles
0 25 50 100 150 200 250
Cities with over 1,000,000 CHICAGO
Cities with 500,000 to 1,000,000 St.Louis
Cities with 100,000 to 500,000 St.Paul
Cities with 25,000 to 100,000 Topeka
Smaller Places Canton
Capitals with less than 25,000 JEFFERSON CITY
Capitals ⊙
Other Cities ○
Williams Engraving Co., N.Y.
105° 100° 95° 90°
45° 40° 35°
Longitude West from Greenwich
DOMINION OF CANADA
LAKE OF THE WOODS
Rainy Lake
Rainy R.
Port Arthur
HUNTERS ISLAND
LAKE SUPERIOR
APOSTLE ISLANDS
Ontonagon
Bessemer
MICH.
Ironwood
NORTH DAKOTA
Morden
Emerson
Bottineau
Souris or Mouse R.
Langdon
St.Vincent
Cando
York
Rugby
Williston
Ft.Buford
Missouri R.
Yellowstone R.
Minot
Devils Lake
Park River
Grafton
Lakota
Larimore
Grand Forks
Cheyenne R.
Carrington
Hillsboro
Red River
Dickinson
Mandan
BISMARCK
Jamestown
Valley City
Fargo
Casselton
Little Missouri
N. Fork Cannonball R.
S. Fork
Lisbon
Oakes
Wahpeton
MONTANA
SOUTH DAKOTA
Grand R.
Moreau or Owl R.
Aberdeen
Webster
Milbank
North Fork Cheyenne R.
Lead
Deadwood
BLACK HILLS
Rapid City
Harney Pk.
PIERRE
Redfield
James River
Watertown
Huron
Bad R.
Brookings
Hot Springs
White River
South Fork
Mitchell
Chamberlain
Flandreau
Madison
Sioux Falls
Canton
Yankton
Big Sioux R.
Vermillion
Elk Point
WYOMING
NEBRASKA
Chadron
Niobrara River
Alliance
North Platte River
Middle Loup
North Loup R.
Loup R.
O'Neill
Elkhorn River
Wayne
Norfolk
Ord
Columbus
Sidney
Broken Bow
North Platte
Julesburg
South Platte River
Grand Island
Kearney
Fremont
Omaha
S.Omaha
York
Plattsmouth
Lincoln
Hastings
Holdrege
McCook
Geneva
Nebraska City
Republican R.
Red Cloud
Beatrice
Fairbury
Sioux City
Missouri River
MINNESOTA
Thief River Falls
Red Lake
Crookston
Bemidji
Grand Rapids
Virginia
Hibbing
Ely
Eveleth
Lake Itasca
Laporte
Leech Lake
Two Harbors
Duluth
Superior
Moorhead
Cloquet
Thomson
Wadena
Brainerd
Mille Lacs
Fergus Falls
Hinckley
Little Falls
Alexandria
Sauk Center
St. Cloud
Mississippi River
Benson
Anoka
St. Croix
Willmar
Minneapolis
Stillwater
St.Paul
Minnesota River
Marshall
St.Peter
Hastings
Red Wing
New Ulm
Mankato
Faribault
Owatonna
St.James
Rochester
Winona
Worthington
Fairmont
Albert Lea
Austin
WISCONSIN
Ashland
Rhinelander
Chippewa River
Antigo
Merrill
Wausau
Chippewa Falls
Eau Claire
Marshfield
Plover
Grand Rapids
Wisconsin R.
Menominee
Sparta
Tomah
La Crosse
Portage
Baraboo
Madison
Prairie du Chien
Platteville
Monroe
IOWA
Spencer
Le Mars
Cherokee
Mason City
Algona
Decorah
Charles City
Oelwein
Des Moines R.
Ft. Dodge
Cedar Falls
Independence
Webster City
Waterloo
Dubuque
Boone
Ames
Marshalltown
Cedar Rapids
Clinton
Iowa R.
Atlantic
Des Moines
Grinnell
Iowa City
Davenport
Council Bluffs
Oskaloosa
Muscatine
Glenwood
Creston
Albia
Ottumwa
Fairfield
Red Oak
Chariton
Burlington
Clarinda
Centerville
Ft.Madison
ILLINOIS
Galena
Freeport
Dixon
Rock River
Sterling
Moline
Rock Island
Kewanee
Princeton
Galesburg
Monmouth
Peoria
Canton
Pekin
Macomb
Lincoln
Beardstown
Quincy
Jacksonville
Springfield
Illinois River
Litchfield
Alton
Granite City
E.St.Louis
Belleville
Du Quoin
Cairo
KANSAS
Colby
North Fork Solomon R.
South Fork
Beloit
Concordia
Atchison
Leavenworth
Manhattan
Kansas R.
Kansas City
Junction City
Topeka
Smoky Hill River
Salina
Abilene
Lawrence
Ottawa
Las Animas
Arkansas R.
Great Bend
Emporia
Garden City
McPherson
Osawatomie
Garnett
Iola
Dodge City
Hutchinson
Newton
Neosho R.
Chanute
Ft.Scott
Kingman
Wichita
Pittsburg
Cimarron
Wellington
Winfield
Cherryvale
Parsons
Chetopa
Arkansas City
Independence
Galena
Coffeyville
COLORADO
MISSOURI
St. Joseph
Maryville
Albany
Trenton
Kirksville
Keokuk
Chillicothe
Brookfield
Macon
Hannibal
Lexington
Marshall
Moberly
Louisiana
Independence
Kansas City
Mexico
Columbia
Boonville
Sedalia
Fulton
St.Charles
Warrensburg
Clinton
JEFFERSON CITY
St.Louis
Osage R.
De Soto
Bonne Terre
Nevada
Lebanon
Salem
Cape Girardeau
Webb City
Carthage
Joplin
Aurora
Springfield
Monett
OZARK MTS.
Westplains
Poplar Bluff
Black R.
Belmont
New Madrid
Caruthersville
Paragould
Jonesboro
OKLAHOMA
TEXAS
North Fork
Canadian R.
Cimarron
Enid
Vinita
Arkansas R.
GUTHRIE
Muskogee
Canadian River
Oklahoma City
Chickasha
Washita R.
McAlester
Ardmore
Red River
Denison
Sherman
ARKANSAS
Eureka Springs
White River
Ft.Smith
Arkansas R.
Argenta
Little Rock
Hot Springs
Pine Bluff
Helena
Memphis
Mississippi River
TENN.
MISS.
KY.

FIG. 96.

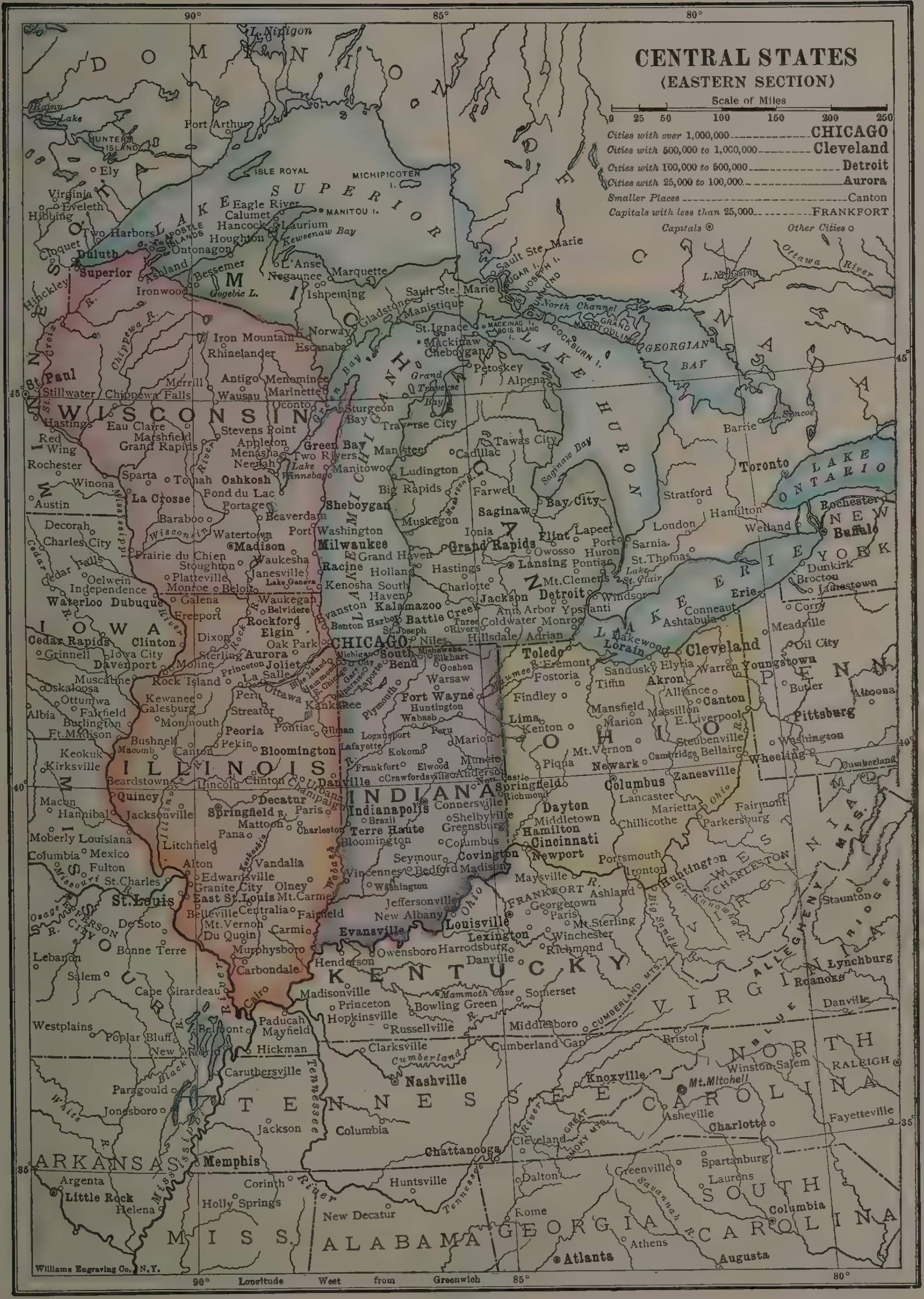
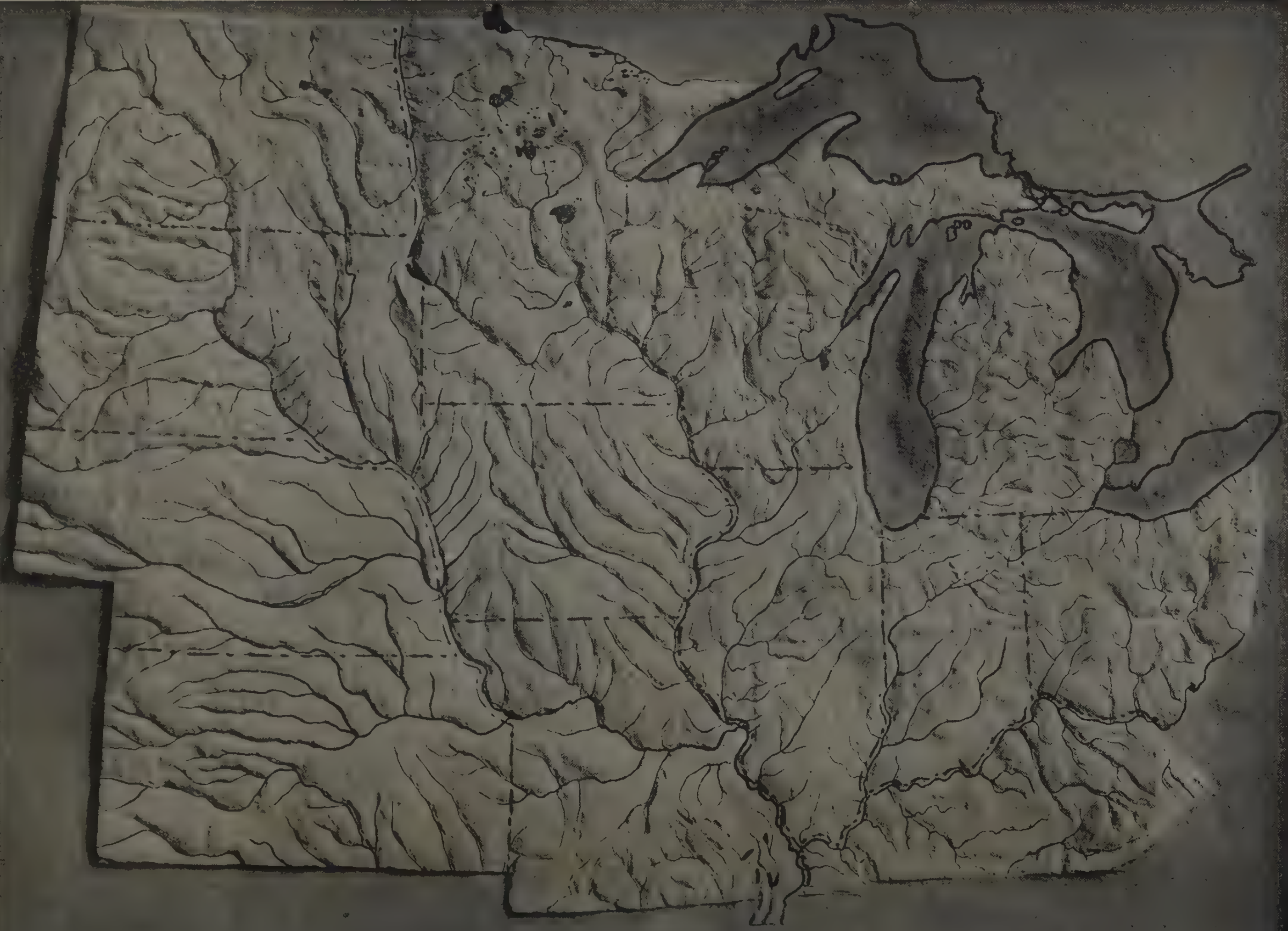

CENTRAL STATES
(EASTERN SECTION)
Scale of Miles
0 25 50 100 150 200 250
Cities with over 1,000,000 CHICAGO
Cities with 500,000 to 1,000,000 Cleveland
Cities with 100,000 to 500,000 Detroit
Cities with 25,000 to 100,000 Aurora
Smaller Places Canton
Capitals with less than 25,000 FRANKFORT
Capitals ◎
Other Cities ○
90°
85°
80°
45°
40°
35°
DOMINION OF CANADA
L. Nipigon
Port Arthur
Rainy Lake
HUNTERS ISLAND
Ely
ISLE ROYAL
MICHIPICOTEN I.
MANITOU I.
LAKE SUPERIOR
Virginia
Eveleth
Hibbing
Two Harbors
APOSTLE ISLANDS
Eagle River
Calumet
Hancock
Laurium
Keweenaw Bay
Houghton
Ontonagon
Cloquet
Duluth
Superior
Ashland
Bessemer
L'Anse
Negaunee
Marquette
Ishpeming
Ironwood
Gogebic L.
Hinckley
St. Croix R.
Chippewa R.
Iron Mountain
Rhinelander
Norway
Escanaba
Gladstone
Manistique
Sault Ste. Marie
Sault Ste Marie
SUGAR I.
ST. JOSEPH I.
DRUMMOND I.
North Channel
GRAND MANITOULIN I.
COCKBURN I.
L. Nipissing
Ottawa River
St. Ignace
Mackinaw
MACKINAC I.
BOIS BLANC I.
Cheboygan
Petoskey
Alpena
Grand Traverse Bay
LAKE HURON
GEORGIAN BAY
St. Paul
Stillwater
Merrill
Antigo
Menominee
Marinette
Chippewa Falls
Wausau
Oconto
Green Bay
Sturgeon Bay
Traverse City
Tawas City
Saginaw Bay
L. Simcoe
Barrie
WISCONSIN
Hastings
Red Wing
Eau Claire
Marshfield
Grand Rapids
Stevens Point
Appleton
Menasha
Neenah
Green Bay
Two Rivers
Manistee
Cadillac
Lake Winnebago
Manitowoc
Ludington
Rochester
Winona
Sparta
Tomah
Oshkosh
Fond du Lac
Big Rapids
Farwell
La Crosse
Austin
Portage
Baraboo
Beaverdam
Sheboygan
Muskegon
Saginaw
Bay City
Toronto
LAKE ONTARIO
Stratford
Hamilton
Rochester
Decorah
Charles City
Watertown
Madison
Port Washington
Milwaukee
Ionia
Grand Rapids
Flint
Lapeer
Port Huron
Sarnia
London
Welland
Buffalo
NEW YORK
Cedar Falls
Oelwein
Independence
Prairie du Chien
Stoughton
Waukesha
Grand Haven
Owosso
Lansing
Pontiac
St. Thomas
Platteville
Janesville
Lake Geneva
Racine
Holland
Hastings
Charlotte
Mt. Clemens
Lake St. Clair
LAKE ERIE
Dunkirk
Brocton
Jamestown
Waterloo
Dubuque
Monroe
Beloit
Galena
Kenosha
South Haven
Jackson
Detroit
Windsor
Erie
Freeport
Waukegan
Belvidere
Rockford
Evanston
Kalamazoo
Battle Creek
Three Rivers
Coldwater
Ann Arbor
Ypsilanti
Monroe
Conneaut
Ashtabula
Corry
Meadville
IOWA
Clinton
Cedar Rapids
Grinnell
Iowa City
Davenport
Dixon
Sterling
Moline
Elgin
Aurora
Oak Park
Benton Harbor
St. Joseph
Niles
Hillsdale
Adrian
Toledo
Lakewood
Lorain
Cleveland
Oil City
Muscatine
Rock Island
Princeton
La Salle
Joliet
CHICAGO
Michigan City
South Bend
Mishawaka
Elkhart
Goshen
Fremont
Sandusky
Elyria
Warren
Youngstown
PENN.
Oskaloosa
Ottumwa
Fairfield
Kewanee
Galesburg
Peru
Ottawa
Blue Island
Hammond
Gary
Valparaiso
Laporte
Plymouth
Warsaw
Fort Wayne
Maumee R.
Fostoria
Tiffin
Akron
Alliance
Canton
Butler
Altoona
Albia
Burlington
Ft. Madison
Monmouth
Streator
Kankakee
Pontiac
Huntington
Wabash
Findley
Mansfield
Massillon
Pittsburg
Keokuk
Bushnell
Macomb
Canton
Pekin
Peoria
Bloomington
Gilman
Logansport
Peru
Marion
Lima
Kenton
Marion
E. Liverpool
Steubenville
Washington
OHIO
Kirksville
ILLINOIS
Lafayette
Kokomo
Frankfort
Elwood
Muncie
Mt. Vernon
Cambridge
Bellaire
Wheeling
Cumberland
Beardstown
Lincoln
Clinton
Urbana
Champaign
Danville
Crawfordsville
Anderson
New Castle
Piqua
Newark
Zanesville
Quincy
Decatur
INDIANA
Richmond
Springfield
Columbus
Lancaster
MD.
Macon
Hannibal
Jacksonville
Springfield
Paris
Indianapolis
Connersville
Dayton
Marietta
Fairmont
Mattoon
Charleston
Brazil
Terre Haute
Shelbyville
Greensburg
Middletown
Hamilton
Chillicothe
Parkersburg
Moberly
Louisiana
Pana
Bloomington
Columbus
Cincinnati
Columbia
Mexico
Litchfield
Vandalia
Seymour
Covington
Newport
Portsmouth
Fulton
MISSOURI
Alton
Edwardsville
Olney
Vincennes
Bedford
Madison
Maysville
Ironton
Huntington
WEST VIRGINIA
CHARLESTON
ALLEGHENY MTS.
St. Charles
St. Louis
Granite City
East St. Louis
Mt. Carmel
Washington
Jefferson City
Jeffersonville
Ohio R.
FRANKFORT
Ashland
Staunton
Osage R.
Belleville
Centralia
Fairfield
New Albany
Georgetown
Paris
Big Sandy R.
Gt. Kanawha R.
De Soto
Mt. Vernon
Du Quoin
Carmi
Evansville
Louisville
Lexington
Mt. Sterling
Winchester
Lebanon
Bonne Terre
Murphysboro
Owensboro
Harrodsburg
Richmond
Danville
Carbondale
Henderson
KENTUCKY
Lynchburg
Roanoke
Salem
Cape Girardeau
Cairo
Madisonville
Princeton
Mammoth Cave
Somerset
CUMBERLAND MTS.
VIRGINIA
Bowling Green
Danville
Westplains
Poplar Bluff
Paducah
Mayfield
Hopkinsville
Russellville
Middlesboro
BLUE RIDGE
Belmont
New Madrid
Hickman
Clarksville
Cumberland
Cumberland Gap
Bristol
NORTH CAROLINA
Winston-Salem
RALEIGH
Black R.
Caruthersville
Nashville
Knoxville
Mt. Mitchell
Paragould
Jonesboro
White R.
TENNESSEE
Tennessee R.
Jackson
Columbia
Asheville
Charlotte
Fayetteville
GREAT SMOKY MTS.
ARKANSAS
Memphis
Mississippi R.
Chattanooga
Cleveland
Spartanburg
Greenville
Laurens
Argenta
Little Rock
Helena
Corinth
Holly Springs
Huntsville
Dalton
SOUTH CAROLINA
Rome
Savannah R.
Columbia
New Decatur
MISS.
ALABAMA
GEORGIA
Athens
Atlanta
Augusta
Williams Engraving Co., N.Y.
Longitude West from Greenwich

FIG. 96.



CENTRAL STATES

Modeled by Edwin E. Howell

contain from 80 to 160 acres. In the main, they resemble the one in Indiana that is here described. On this Indiana farm of 160 acres, is a house in which the family lives, with a barn near by for horses, milch cows, and hay, with possibly a silo, and with sheds near it for storing grain and farming implements.

2. A farm in Indiana

(1) *The buildings and surroundings*

A windmill perhaps at the rear of the house keeps the milk house well supplied with cold water, and also fills the water troughs in the barnyard. Near the house is an orchard of apple, peach, and pear trees, with a few rows of berry bushes in one part, and a chicken house in another (Fig. 98). Here enough chickens are raised to supply some meat, and all the eggs that are needed, with some to sell. Between the orchard and the barn, is a garden of vegetables. Still back of that are several pigpens, in which hogs are fattened for home use, and also for the market.

FIG. 98. — A farmer feeding his chickens and turkeys.

Farther away from the house are fields in which there are at least three or four different kinds of crops. Every farmer in that vicinity expects to raise corn, wheat, or both — perhaps sixty acres in all — some other kind of grain and some grass for grazing and for hay.

(2) *The fields, and what is done with their crops*

After these crops are harvested, they are either sold or fed to stock — horses, cattle, hogs, or sheep — upon the farm. The latter plan is often followed, chiefly because it pays better to fatten stock and sell it, than to sell the crops themselves. There are generally two or three good milch cows on the farm, which not only supply the family with fresh milk and butter, but furnish some cream or butter to sell.

In the vicinity of the many towns and villages in rural communities there are fine farm homes where the farmer and his family enjoy all the advantages of rural and city life. Farm homes distant from villages are brought into communication with neighbors, friends, and tradespeople by the telephone, the parcel post, and rural delivery of mail. The state is covered by a network of interurban railway lines. This makes travel in rural sections very convenient. Many farmers, too, have automobiles which they use much in visiting neighbors and friends.

(3) *Social life of the neighborhood*

Farm life is no longer as lonesome as it used to be and the hard work of the farm has been much reduced by labor-saving machinery. The farmer enjoys this life greatly, because he likes to take care of his stock, to work in the soil, and to watch his crops grow. In addition, he is able to raise most of his own food, and his whole life is more independent than that of persons in a town or city.

(4) *Why farm life is attractive*

Some of our greatest men have come from farms. Can you name two Presidents who spent their childhood on farms of the Central States? Where were their homes? What can you tell about their early life?

Corn (Fig. 100) is raised in most of the states of the Union, and you have already learned how important it is in the South. It

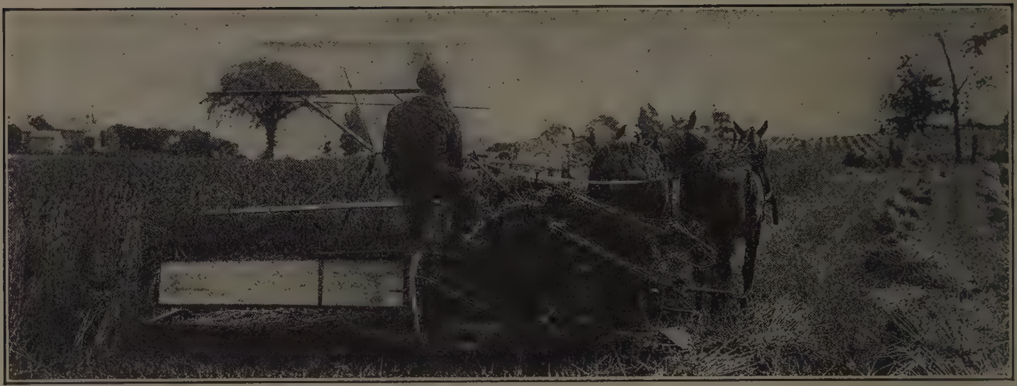


Fig. 99. — A farmer cutting and binding wheat in the harvest season.

3. Indian corn, or maize

(1) Extent to which it is raised

is in the Central States, however, that we find the greatest amount. The *corn belt* of the country (Fig. 186) extends from Ohio to central Kansas and Nebraska, with smaller quantities raised to the north, south, east, and west of it. Farmers within this belt usually expect to devote from one third to one half of their land to corn; therefore, in traveling across these states in summer, one sees cornfields in every direction.

(2) How it is cultivated and harvested

The seed is planted in rows in the springtime. Soon the little stalks appear above ground, growing rapidly during the hot summer months, until they reach a height of from seven to ten feet (Fig. 101). In order to keep the soil loose, and kill the weeds, the ground between the rows is plowed when the corn is young; but as it grows higher, the shade of its leaves protects the soil from both drought and weeds.

A cornfield usually presents the most beautiful appearance in July, when the corn "tassels out" (Fig. 101). The plants then entirely hide the ground from view, and the rich green stalks, with their long, slender leaves, bend to the breezes in the most graceful manner.

If the stalk is to be used as fodder for cattle in winter, it is cut before frost, when the kernels on the cob are still somewhat soft and milky. If left until after frost, the grain hardens, and then the harvest season begins. Men drive into the fields in wagons and tear the husks from the ear, spending day after day at that kind of work.

(3) Its uses

Corn is put to many uses. Much that is raised is fed to cattle and hogs, as already stated. Some is made into hominy and breakfast foods, or into corn meal. Starch is another product, and a very extensive use of the grain is in the

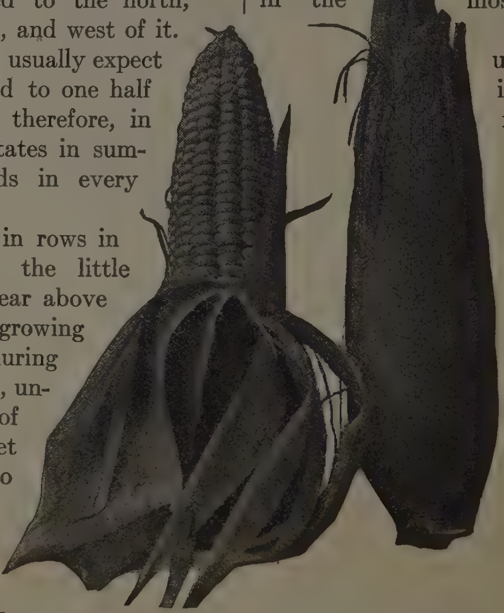


Fig. 100. — Two ears of corn, the one on the left with the husk turned down to show the kernels of corn on the cob.

manufacture of whisky in *distilleries*. There are many distilleries in ST. LOUIS, and other cities within the corn belt. PEORIA, in central Illinois, is another great center for distilleries. The chief corn-producing states are Iowa, Illinois, Nebraska, and Indiana.

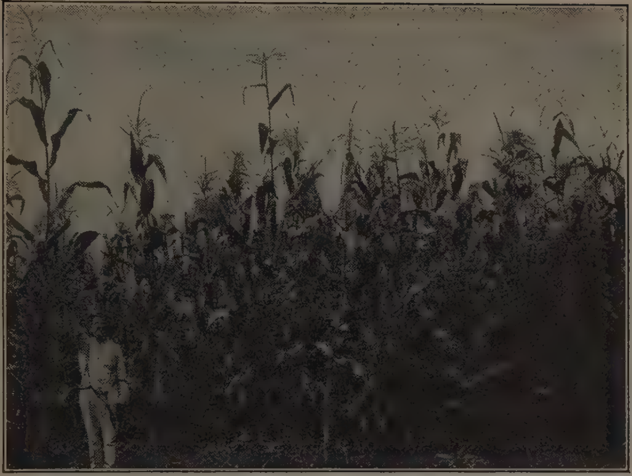


FIG. 101. — View in a cornfield in Nebraska. Notice how very tall the corn grows in this fertile soil.

4. Wheat

(1) *Extent of its production*

Wheat, like corn, is produced in all the Central States, as well as in other parts of the country (Fig. 188). It is an especially important product in Kansas, North Dakota, Nebraska, Minnesota, and Indiana; but the section which at present is most noted for wheat is the valley of the Red River of the North (Fig. 102). In this valley there is a broad, level plain, including western Minnesota, eastern North and South Dakota, and a portion of Manitoba, which is one of the finest wheat regions in the world.

(2) *How cultivated on a large farm*

Upon this plain one may ride on the train northward toward Winnipeg all day long, and see scarcely a single crop besides wheat. Most of the farms are of moderate size, but some are enormous. For example, one farm in North Dakota contains over thirty thousand acres. How many square miles is that?

(3) *Influence of wheat on growth of cities*

The great quantity of wheat produced in the Red River Valley and the neighboring region has helped in the growth of the cities of MINNEAPOLIS, ST. PAUL, and DULUTH. It has also caused the growth of cities in the midst of the wheat fields, like FARGO in North Dakota and SIOUX FALLS in South Dakota. Since most of the grain is shipped to the East or South, it has influenced the growth of scores of other cities along the Great Lakes,

FIG. 102. — Harvesting wheat on a large farm on the plains of the fertile Red River Valley of the North.

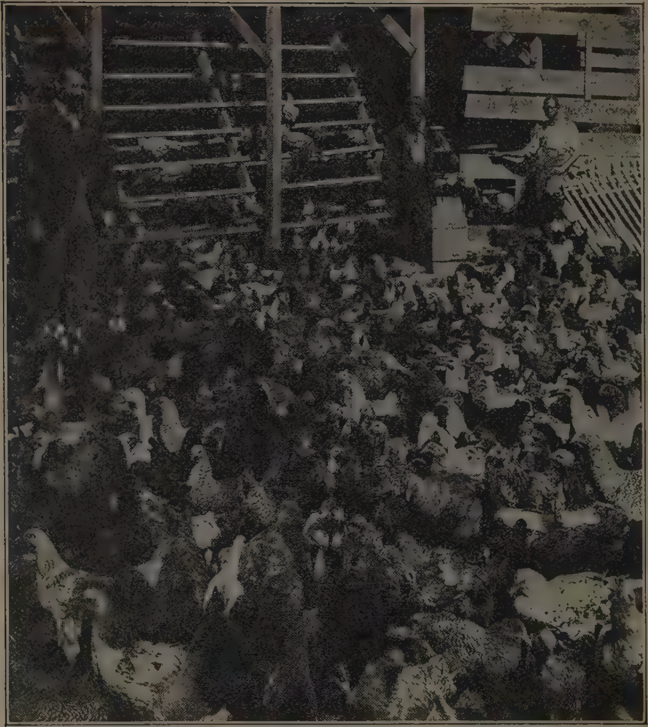


FIG. 103. — A scene on a chicken farm in southern Missouri. There are hundreds of chickens on this farm.

the Mississippi River, and even on the Atlantic coast. State how this can be.

5. Fruits and vegetables

(1) Fruits

While each farm in the Central States usually has a small orchard, like that on the Indiana farm, fruit raising is a *special* industry in those sections where the climate and soil are favorable, as in the neighborhood of the Great Lakes. You have already learned that the immense area of water in these lakes, which do not freeze over in winter, renders the summers cooler, and the winters warmer, than they would otherwise be. This is why the grape belt of western New York (p. 33) extends westward along the shores of Lake Erie far into Ohio.

The Michigan Peninsula, which has Lake Michigan on the west, and Lakes Huron and Erie on the east, is also a noted fruit-raising region. Here great quantities of peaches, apples, and other fruits are produced. With what part of the Atlantic coast can this fruit region be best compared (p. 29)?

While these regions are especially noted, the raising of fruits is common in all the Central States. Among the kinds raised are peaches, grapes, apples, cherries, plums, and berries.

(2) Vegetables

Vegetables of many kinds, such as sweet corn, potatoes, turnips, beets, cabbages, tomatoes, peas, beans, lettuce, pumpkins, squashes, and celery are also raised in all of the Central States. Some of these are grown for use at home, some for canneries, and some for sale in the cities. The fact that there are so many cities makes truck farming profitable in their neighborhood, as is the case in New England.

6. Tobacco

Tobacco is another valuable farm product in the Central States (Fig. 193). While it is raised in many sections, the greatest quantity comes from Ohio, which ranks with Virginia, North Carolina, and Tennessee as leading tobacco states. St. Louis is an important tobacco market. What other cities have the same industry (pp. 67 and 75)?

7. Domestic animals

(1) Principal kinds, and their distribution

Some domestic animals are raised on almost every farm. Among these the most important are horses, cattle, sheep, hogs, hens, and turkeys. Some farms, however, are mainly devoted to one or a few kinds (Fig. 103). For example, in the more hilly sections, where it is not easy to cultivate grain, cattle and sheep are numerous, and dairying is important. Ohio is one of the foremost sheep-raising states. More horses and more hogs are raised in Iowa than in any other state in the Union, and more milch cows than in any other state except New York.

8. Other farm products

Great quantities of oats and barley are raised in the Central States. The former is a common food for horses, but the latter is largely used in the manufacture of beer. The great breweries, found in every large city, consume immense quantities of barley in order to obtain the *malt* which is needed in making beer. In CINCINNATI, ST. LOUIS, and MILWAUKEE, beer making is one of the important industries.

Another farm crop in some sections is flax. From the bark of the flax stem a fiber is obtained which is used in making linen, while linseed oil is made from the flax seed. Hops, used with barley in making beer, are also raised; and rye and buckwheat are produced on many farms. Sugar beets are now cultivated in many states, and they supply a part of the sugar consumed in the country.

Finally, a vast amount of hay is grown; some of it is fed to farm animals, but much is sold in the cities for the use of the horses there. The hay crop is one of the most valuable in the Central States.

Agriculture in the arid section

1. Meaning and extent of the Great Plains

Passing westward from the fertile valley of the Red River of the North, one finds the farmhouses decreasing in number, and the country becoming more and more arid, until, finally, in western North Dakota, there is very little farming without irrigation. At the same time, the plains gradually rise higher and higher, until, near the base of the Rocky Mountains, an elevation of fully a mile above the sea is reached. This arid plateau, extending from Canada to southwestern Texas (p. 55), is commonly known as the *Great Plains*.

2. Irrigated sections, and their products

The soil is excellent, and where irrigation is possible, there are fine farms. In many places the streams furnish water for irrigation; in others, water rises to the surface when wells are driven into the earth. Such wells, from which the water often gushes forth as in a fountain, are called *artesian wells* (Fig. 104). The water comes from the rock layers underground, and by its help much land is now cultivated which a few years ago was of little use.

Every year the amount of land cultivated in this section is increasing; and now that the government is building reservoirs to store the waters that otherwise run off through the rivers in spring, there will be still more land under irrigation. These irrigated farms produce the same crops as other parts of the Central States. Crops that will grow in a dry climate are also being introduced (called "dry farming"), and this is another reason why farming is increasing here.

Still, most of the arid region of the Great

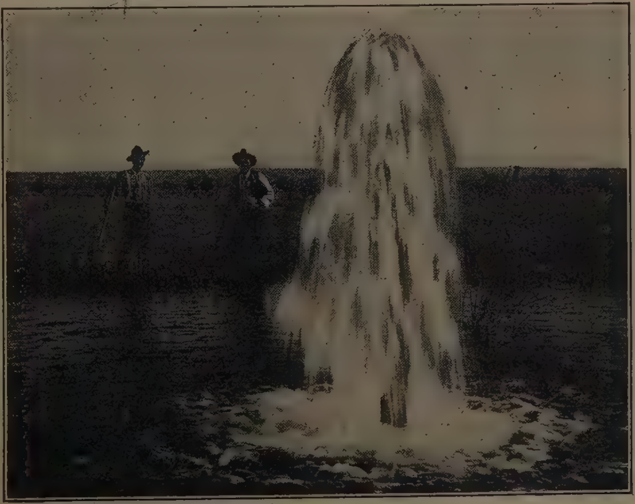


FIG. 104.—An artesian well supplying water for use in irrigation in western United States.

Fig. 105. — Cowboys and cattle on a ranch in western United States.

Plains is unsuited to farming. For that reason there are few towns and no large cities, as you can see on the map (Fig. 96).

3. Ranching
(1) Its extent

The entire western third of North and South Dakota, Nebraska, and Kansas, as well as the Great Plains farther west, are given over mainly to *ranching* (Fig. 105).

(2) Location of the ranchman's house and corrals

This industry is carried on in much the same way throughout all parts of the arid West. In western North Dakota, for instance, there is little water except in the widely separated streams, and there are very few trees except along the stream banks. Since the ranchman must have both water and wood, he locates his house, sheds, and stockades, or *corrals* (Fig. 106), within easy reach of these two things. If there is no neighbor within several miles, it is all the better, for his cattle are then more certain to find abundant grass.

(3) Why few fences

Few fences are built, partly because most of the region is owned by the government, not by ranchmen. Very often they own only the land near the water; but this gives them control of the surrounding land, for it is of no use to any one else if his cattle cannot reach the water. Another reason why fences are not common is that it is necessary for the cattle to roam far and wide in their search for food. The bunch grass, upon which they feed, is so scattered that they must walk a long distance each day to find enough to eat.

A single ranchman may own from ten to twenty thousand head of cattle, and yet they may all be allowed to wander about upon public land, called "the range." Usually they keep within a distance of thirty miles of the ranch-house; but sometimes they stray one or two hundred miles away.

(4) Object of first round-up and how accomplished

Twice a year there is a general collection, or *round-up* (Fig. 107), of cattle, — the first round-up occurring in May or June, and the other early in the fall. One object of the first is to brand the calves that have been born during the winter.

Since there are few fences, cattle belonging to ranches which are even a hundred miles apart become mixed during the winter; and those in a large herd may belong to a score of different ranchmen. Each cattle owner has

Fig. 106. — Cattle in a corral on a western cattle ranch.

a certain mark, or *brand* in the form of a letter, a cross, a horseshoe, etc., which is burnt into the side of every calf.

A round-up, which lasts several weeks, is planned by a number of ranchmen together. A squad of perhaps twenty cowboys, with a wagon and provisions, a large number of riding horses, or "ponies," and a cook, go in one direction; and other wagons, with similar "outfits," set out in other directions. Before separating in the morning, the members of a squad agree upon a certain camping place for the night, and they then scour the country to bring the cattle together, riding perhaps sixty or eighty miles during the day.

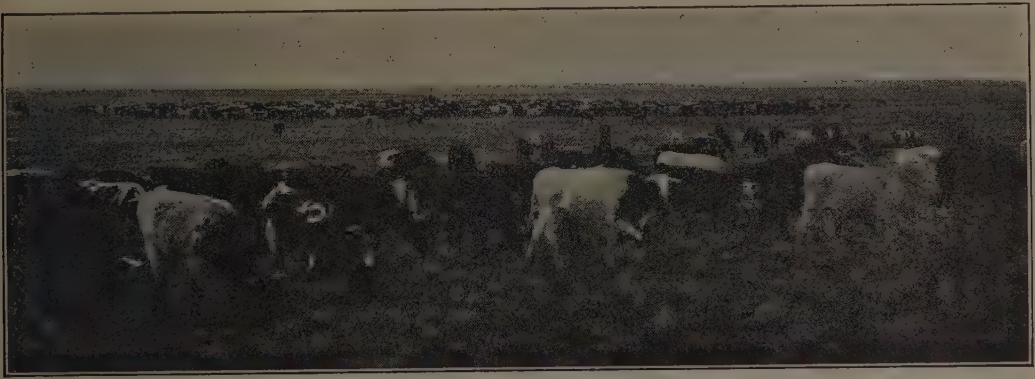


FIG. 107 — A round-up on the Great Plains. All the cattle in the distance belong to one ranchman; those in the front of the picture to another.

Each ranchman knows his own cattle by the brand they bear; and since the calves follow their mothers there is no difficulty in telling what brand shall be placed on them. After branding the calves, each ranchman drives his cattle homeward, to feed during the summer within a few dozen miles of their owner's home.

(5) *Second round-up, and what follows*

The second large round-up is similar to the first, except that its object is to bring together the *steers*, or male cattle, and ship them away to market; it is therefore called the *beef round-up*. A ranchman who owns twenty thousand cattle may sell nearly half that number in a season. As the steers are collected, they are loaded upon trains and shipped to distant cities to be slaughtered (p. 97).

Very often the cattle have found so little water, and such poor pasturage, that they have failed to fatten properly, and must be fed for a time before being slaughtered. This may be done upon the irrigated fields near the rivers in the ranch country; or the cattle may be sent for this purpose to the farms farther east, as in Kansas, Missouri, Iowa, and Nebraska.

(6) *Life of the ranchman*

The lives of ranchmen and cowboys are interesting and often exciting, most of each day being spent in the saddle (Fig. 108). They are so far separated from other people that they must depend upon themselves far more than most people do. For instance, a ranchman must build his house, kill his beef and dress it, put up his ice, raise his vegetables, do his blacksmithing, find his fuel, and even keep school for his children if they are to receive an education. He affords a good example of the pioneer life which was so common in early days.

Although so much of the land is under cultivation, or given over to ranching, forests are found in many sections. In Wisconsin,

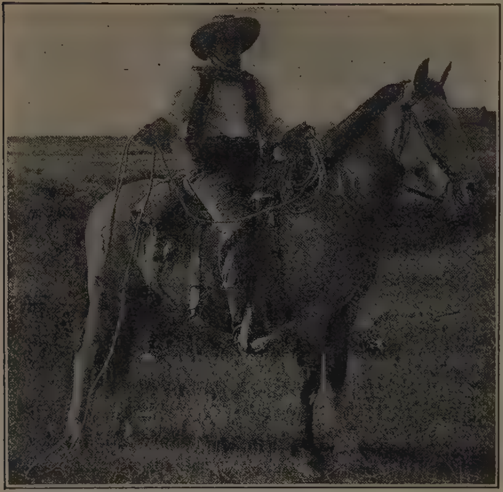


Fig. 108. — A cowboy and his pony. The rope in his hand is his lariat, with which he lassoes the cattle.

Lumbering

1. Extent of forest, and kinds of trees

for instance, in traveling northward from the well-cultivated southern portion, one comes to a section where farmers are beginning to take the place of lumbermen. Many log huts stand here in small clearings, with the green fields still dotted by tree stumps. But beyond, little else than woods can be seen.

In these forests are many kinds of trees belonging to the north, especially the evergreens, such as hemlock, spruce, white pine, and cedar. There are also some hard woods, such as oak, birch, and maple.

2. Method of lumbering, and centers for lumber

Lumbering is still an important industry in the neighborhood of the Great Lakes. It is carried on in much the same manner as in Maine (Fig. 109), although a great deal of the timber is brought to the sawmills by wagons or rail, instead of being floated a long distance downstream.

The excellent water power in the Mississippi River, at Minneapolis, early led to the building of sawmills there, and made that city famous for lumber. Other mills are situated farther down the Mississippi, as at Winona. They are also numerous at Duluth, in Minnesota, and at Superior, which is just across the state line in Wisconsin.

Fishing

Since the Central States have no seacoast, all the oysters, cod, and other sea fish consumed in this section must be brought from the Pacific coast, or from the Atlantic or Gulf coasts.

The Central States, however, are not entirely dependent upon the sea for their fish. In the rivers there are some excellent fish, quite different from those in the ocean; and in the lakes there are still other kinds. There is, therefore, considerable fishing here, especially on the Great Lakes; but the fishing industry is by no means so important as in the groups of states already studied.

Mining

1. Coal

(1) ***Its wide distribution***

Coal is mined in almost all the Central States. Illinois produces most, ranking next to West Virginia among the states of the country. Ohio produces almost as much, however, and large quantities come from Indiana, Iowa, Kansas, Missouri, and Michigan. There is so much coal in this sec-

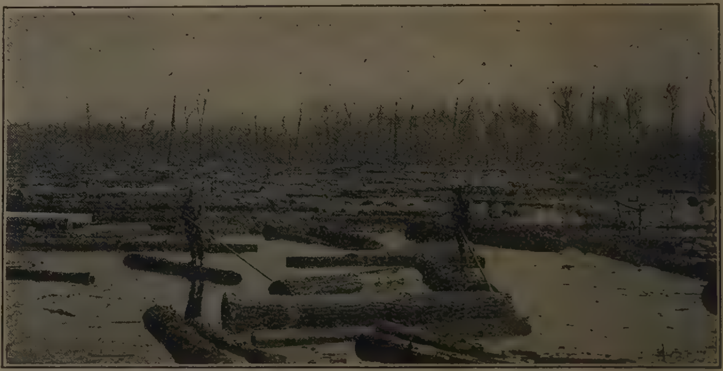


Fig. 109. — Floating logs downstream to a sawmill in Wisconsin.

tion, and it is found throughout so large an area, that it is easy to obtain fuel for manufacturing in almost every part.

(2) *Kind of coal, and method of mining it*

While Pennsylvania produces two kinds of coal, anthracite and bituminous, the Central States have only the latter kind. But it is bituminous coal that is used in making coke, and because there is so much of this kind of coal, it is of great value for iron manufacturing. In some places the coal beds lie near the surface, like rock in quarries, and then the mining is very simple; in others it is buried so deep that long shafts must be sunk to reach it.

2. Oil and gas
(1) *Where found*

When oil and natural gas were first discovered in New York and Pennsylvania, it was supposed that they did not exist elsewhere; but they have since been found in many places. Name some of them. Both oil and gas are found in several of the Central States, especially Illinois, Ohio, and Indiana. Many farmers, whose soil is no better than that of their neighbors, have suddenly become rich by the discovery of oil or natural gas in the rocks far beneath the surface (Fig. 110). In fact, these substances are so abundant in some places that towns, like FINDLAY in western Ohio, have sprung up like mushrooms.

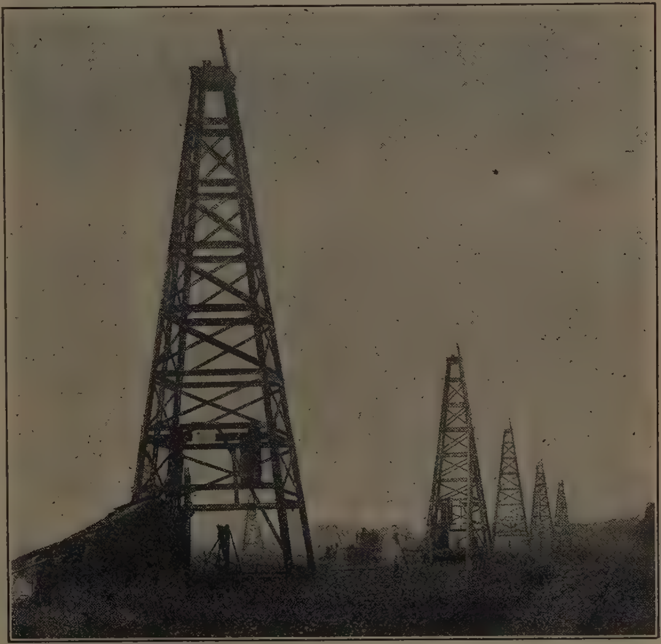


FIG. 110.—A view in the oil fields of Kansas. There is an oil well under each derrick.

The way in which gas and oil are formed, and the uses to which they are put, have already been described.

(2) *Cheapness of gas as a fuel*

In many places in the Central States natural gas is in common use, furnishing both light and heat in the houses, and fuel in the factories. It is a very cheap fuel, for, after the hole is bored into the earth, it costs almost nothing to produce the gas. The main expense is the cost of the pipes through which it passes.

3. Iron ore
(1) *The Lake Superior district*

Formerly Pennsylvania was the chief iron-producing state, having both coal and iron ore; but some years ago explorers discovered enormous beds of iron ore near the western end of Lake Superior. In some places the ore is so soft that, like gravel, it can be dug out with steam shovels, and very often it is so near the surface that the mines are open pits. In other places the mining is done underground. That is the case, for example, at ISHPEMING, in northern Michigan (Fig. 111).

This Lake Superior district is now the leading iron-producing center of the world. It includes parts of three states, — Michigan, Wisconsin, and Minnesota, — the most im-

Fig. 111. — An electric motor in an iron mine at Ishpeming, Michigan.

portant being Minnesota (Fig. 112), and the least important Wisconsin. These three states together produce sixty-two times as much iron ore as Pennsylvania, and four-fifths of all the iron ore of the country. The enormous development of mining in this region has caused numerous towns and cities to grow up here.

(2) Why the ore must be transported, and from what ports

It is a very unfortunate fact that there is no coal in this iron district. For in order that the ore may be reduced to the metal, either coal must be carried to the iron mines, or else the ore must be moved to the coal regions. The latter has proved the cheaper. Accordingly, hundreds of boats sail every year from the lake ports of Duluth, Superior, Ashland, and Marquette, loaded with ore for the manufacturing centers along the lakes.

(3) How it is loaded, and where sent

Fortunately the iron deposits are located near waterways. If it were necessary to haul the heavy ore a long distance by rail, the expense might be so great as seriously to check its production. As it is, however, the ore is mined, loaded upon cars and sent over short lines of railway to the lake shore.

As the ore must reach a point where coal is easily obtained, it is taken to such lake ports as Chicago, Detroit, Toledo, Cleveland, Buffalo, and Gary. Notice how close to these cities the coal beds extend. From the lake ports the ore is also carried by rail to Pittsburgh, as well as to many other places in the midst of the coal fields.

Another metal found in the Central States, particularly in northern Michigan, is copper, which is valuable in many ways. It is one of

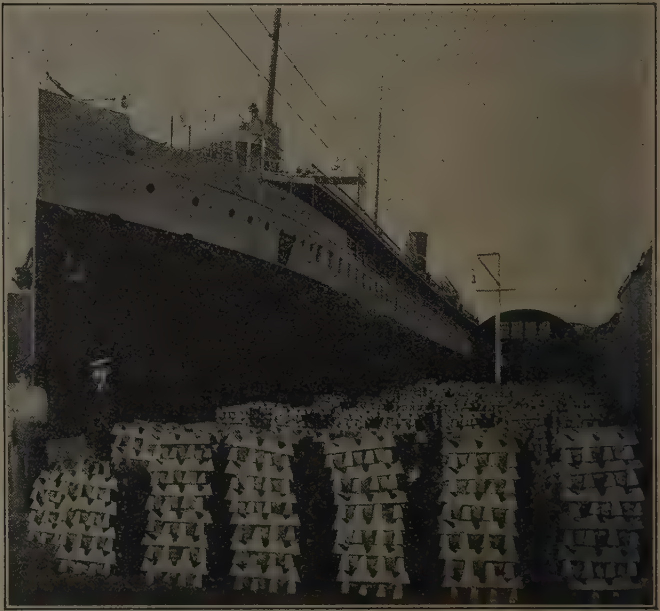


Fig. 112. — Bars of copper on the dock at Houghton, Michigan. These are to be carried away by the large lake steamer.

the metals used to make bronze, and also brass; but of late years a new and even greater demand for this metal has arisen. Electricity passes through copper more easily than through other common metals; copper is, therefore, the best material for trolley wires, for the wire of long-distance telephones, and for the wire used in electric lighting. Since the use of electricity is rapidly increasing, there is a growing demand for copper.

4. Copper ore
Uses of copper

There is an abundance of *building stones* in the Central States. Among these are sandstone and limestone, which are shipped in all directions for building purposes. Limestone is also used in iron smelting and in making Portland cement. In addition, there are slates and granites in the hilly and mountainous sections, as there are in New England (p. 33).

5. Other mineral products
(1) *Building stones, sand, and clay*

Several states produce much *sand*, which is melted and made into window glass, bottles, and other objects. Clay of various kinds, used in making brick, tiles, or pottery, is abundant in all the states.

Lead and zinc, two other metals found in the Central States, occur in pockets and little veins in layers of limestone. The ores are mined in many places, as at JOPLIN, Mo., and then sent to furnaces, where the pure metals are separated from the ore. A large part of our supply of lead and zinc is obtained from Missouri. What are some of the uses of these metals? Of what use should you think this lead was to the early pioneers?

(2) *Lead, zinc, and gold*

Gold and *lignite* are mined in considerable quantities in the Black Hills, in the extreme western part of South Dakota.

Much salt is obtained in the Central States, especially in Michigan. This state produces more salt than any other in the Union, New York ranking second, Ohio third, and Kansas fourth.

(3) *Salt*

The abundance of coal, gas, and water power, together with raw materials, has led to very extensive manufacturing in the Central States.

Manufacturing

Great quantities of corn are consumed in making corn meal, hominy, starch, and breakfast foods; and some is also used in distilleries. There are many flour mills where wheat is made into flour; large quantities of oats are made into oatmeal; and much barley is consumed in the breweries. Canning of fruits and vegetables is extensively carried on at many places, and the making of sugar from the sugar beet has come to be of great importance.

1. Manufactures from agricultural products

The ranches in the arid section, as well as the farms in general, supply animals from which meat, lard, soap, and various other products are made in several of the large cities. The hides of these animals are made into shoes, gloves, traveling bags, and other articles, while the wool is manufactured into clothing. Cotton is brought from the South to be made into cotton goods. Much butter and cheese is made in every state.

Near the forests, both along the streams and on the shores of the Great Lakes, the manufacture of furniture and other articles of wood is an important industry. On many of the rivers of Minnesota, Wisconsin, and Michigan, where there is abundant water power, there are sawmills, furniture factories, and planing mills. Some of the most important are located in OSHKOSH in Wisconsin, and SAGINAW, BAY CITY, and GRAND RAPIDS in Michigan. School desks, office desks, chairs, tables, and other kinds of furniture are made at Grand Rapids, which city is especially noted for the manufacture of furniture. CHICAGO manufactures furniture to a considerable extent.

2. Manufactures from forest products

The crude oil is made into many products, as in the Middle Atlantic States. Name some of these products (p. 34).

3. Manufactures from mineral products

(1) Manufactures from oil and ores

The manufacture of iron ore into iron and steel goods occupies an enormous number of men in hundreds of cities and towns. The manufacture of copper goods is another extensive industry, and many products are made from lead and zinc. Metal manufacturing in the Central States is quite as important as in the states along the Atlantic coast, and the industry is rapidly growing.

Fig. 113. — The employees of a large manufacturing plant in Dayton, Ohio, at luncheon.

(2) Manufactures from clay and limestone

Much of the deep soil left in the prairie states by the glacier is a clay which is useful in the manufacture of bricks. As in other sections of the country (p. 37), there are many brickyards, especially near the large cities. From this same kind of clay, flowerpots, drainpipes, and other articles are made. During recent years, when drainage of farm land has become common, the manufacture of tile for that purpose has developed into a great industry. Many a small town has a tile factory.

In Missouri, Indiana, Michigan, Ohio, and other states of this section, Portland cement is made from limestone. Pennsylvania produces most cement, but several of the states produce large amounts.

Transportation of goods

The handling of so many raw materials and manufactured products leads to extensive commerce. The transportation of bulky goods, such as ores, coal, and wheat, is particularly important where the coal and iron ore are so widely separated, and where far more wheat is raised than can be consumed.

The importance of the Great Lakes in bringing the ores to the coal and the wheat to the Eastern markets is evident. From Duluth to Buffalo there is only one place where navigation is interfered with. That is at the outlet of Lake Superior into Lake Huron, where there are some rapids. Here a broad canal, large enough for the great lake vessels, has been dug. It is called the *Soo Canal* (Fig. 114), after the city SAULT STE. MARIE, located at this point.

The Mississippi, Ohio, and Missouri rivers, with many smaller tributaries, drain almost the entire area of the Central States. Which parts are not in the Mississippi River drainage area? The three rivers named, as well as many smaller ones, are navigable. Thus the Great Lakes and the rivers together afford admirable water transportation for goods in all directions.

Railroads have been very easily built in this level country, and they connect these two vast waterways at many points. Most of the great railroad systems that cross the continent from east to west pass through either Chicago or St. Louis.

Principal cities along the Great Lakes

Since the Central States have no ocean coast, we naturally find the principal cities along the Great Lakes and the three great rivers, where it is possible to ship goods by water. Let us first consider those along the Great Lakes.

1. Duluth and Superior

At the western end of Lake Superior there is a fine harbor, one side being in Minnesota, the other in Wisconsin. Upon this harbor are two cities, DULUTH and SUPERIOR, which together have a population of over one hundred thousand. The chief products of this vicinity are iron, lumber, and wheat, which are shipped eastward in immense quantities from these two ports. Owing to the nearness of these cities to the Minnesota and Dakota wheat fields, there are enormous elevators for storing grain, and flour mills for grinding it into flour.

2. Chicago

(1) History of this region

Locate Chicago. At this point the small Chicago River empties into Lake Michigan, forming a small harbor, on which a fort was located in early times.

(2) Advantages of this site

As the West developed, this site proved to be a most favorable one; for whenever a railway was built from the East to the Northwest, it was necessary for it to pass around the southern end of Lake Michigan. As the city grew in size, other railways were built to it *because* it was large; and now they approach it from the east, west, north, and south. Thus Chicago has become a great railway center.

The city is an important shipping point for grain, because it lies in the midst of the most productive grain region in the world. It is also within easy reach of extensive coal fields, and lumber and iron ore are readily brought to it by boat. These facts have caused Chicago to have a wonderful growth. In the year 1840, there were but 4470 inhabitants; in 1870, 300,000; in 1910, 2,185,283; and now it is the second city in size in the New World. It has long since outgrown its small natural harbor, and a much larger one has been made by building long breakwaters out into the lake.

(3) Meat packing and related industries

Chicago is not only a great grain market, but also the most important meat market in the world. All the grazing states of the West ship stock to this point, and in the city itself nearly a square mile is taken up by the Union Stock Yards (Fig. 115). In these are large sheds for the various kinds of stock, pens with high fences, and troughs for food and water (Fig. 116). Train loads of cattle, hogs, and sheep are unloaded here every day. The work employs about thirty thousand men.

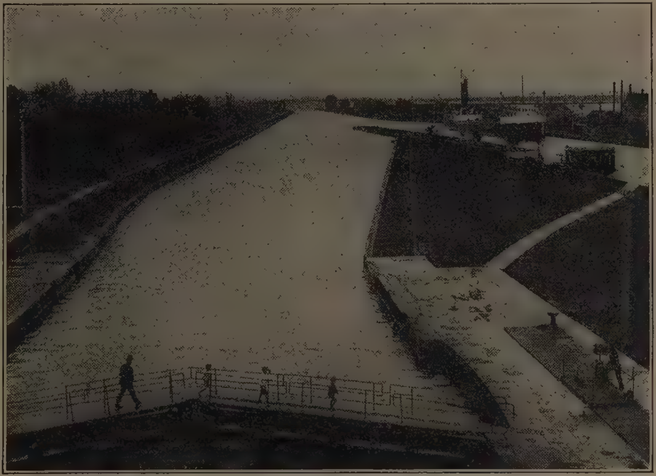


FIG. 114. — The "Soo" Canal. Boats going west pass through the canal on the right; those going east pass through the canal on the left. In the very front of the picture is the gate of a lock.

The packing houses send out a number of products. By far the most important is meat, for most of the cities of the East are furnished with fresh meat from Chicago and other Western cities. Both live cattle and fresh meat are sent in large quantities to Europe also. It may be several weeks after the meat is prepared for food before it reaches the table; yet all this time it is kept fresh by the use of ice. Special refrigerator cars are built for the sole purpose of carrying it.

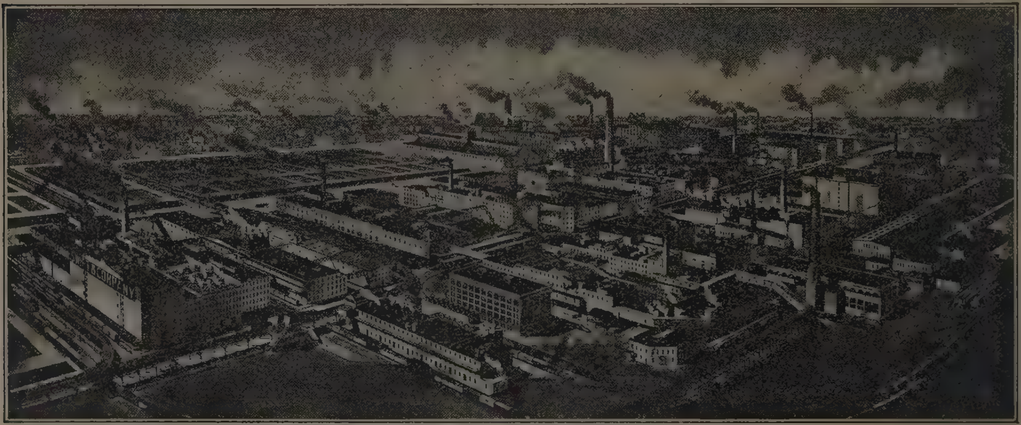


FIG. 115. — A general view of the stock yards at Chicago.

Besides the meat that is sold fresh, a great deal is canned. The fat of the hog is made into lard, and not a little beef fat is made into imitation butter, called oleomargarine. Many of the bones are burned and used in the manufacture of sugar (p. 58); and the horns and hoofs are of use in making gelatine and glue. The hides are made into shoes, gloves, harnesses, and other leather goods.

FIG. 116. — A view of a small part of the stock yards (Fig. 115), showing cattle in the pens.

Nothing is wasted in the packing business; even the bristles of the hog are saved and made into brushes; and the hair from the hides of cattle is valuable in making plaster.

It is from the Western packing houses that the shoe factories of Lynn, Haverhill, Brockton, and other cities are supplied with much of their leather. The hides, however, must first be sent to tanneries. One of the principal places for tanneries is MILWAUKEE, which obtains tannic acid from the bark of the hemlock tree that grows in the forests of Wisconsin.

(4) *Other manufacturing*

There are many companies engaged in the making of iron and steel goods; one of them alone, the Illinois Steel Company, employs ten thousand men. An enormous amount of furniture is made, and the manufacture of farming implements is also very extensive. Chicago is the home of the National Harvester Company, which controls the manufacture of farming implements in most parts of the country. A single one of its plants sends out about three hundred thousand farm machines every year. The Pullman Car Works made as many as ten thousand freight cars in one year, besides several hundred Pullman and passenger cars. As in New York (p. 43) and other great cities, the making of clothing is one of the most important industries. These are but a few of the kinds of manufacturing in this great city where there are thousands of factories.

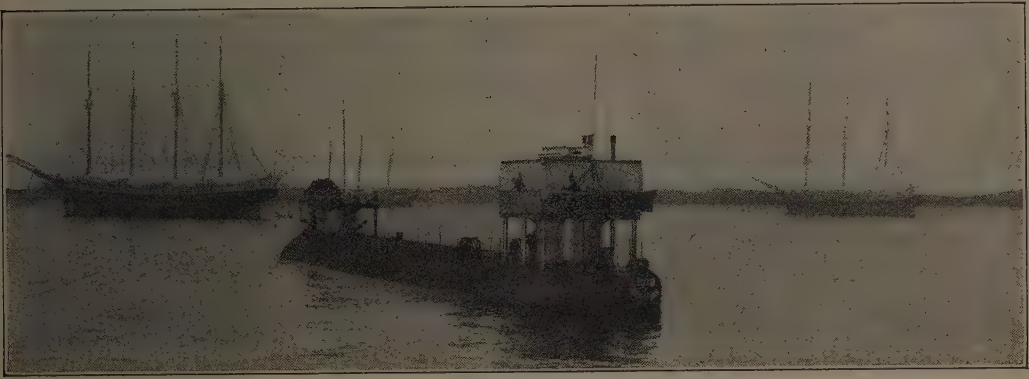


Fig. 117. — Shipping on the Great Lakes. The peculiar ship in the foreground is called a whaleback.

(5) *Transportation and sewage*

Like other very large cities, Chicago has much difficulty in providing transportation for the people of the city. Street cars are one important means, and many steam railways carry passengers to and from the heart of the city. There are elevated railways, also, as in New York, and underground roads, as well. But unlike New York, the underground roads are used mainly for hauling freight.

Another great difficulty has been the proper care of the sewage of the city. For a long time it was poured into Lake Michigan; but as the drinking water was taken from the lake, this became very dangerous to the health of the people. In order to carry it away, an immense drainage canal has been dug, connecting Lake Michigan with the Illinois River, and thus setting the current toward the Mississippi and the Gulf of Mexico. This drainage canal, which is wide and deep enough for boats, may in time develop into a ship canal. In that case, large ships may reach Chicago from the Gulf of Mexico, as they now do from the Gulf of St. Lawrence. What effect would this have upon the city?

(6) *Education*

Chicago has an excellent system of education, from the lowest grades to the university, and hundreds of buildings are given up to this work alone. The chief educational institution is the University of Chicago, which, although established as recently as 1890, now has more students than some of the older universities of the East. At Evanston is the Northwestern University; and at Champaign the University of Illinois, one of the most progressive and rapidly growing of the state universities.

3. Milwaukee and Racine

Other large cities along the lakes are engaged in many of the same industries as Chicago. Milwaukee, the largest city in Wisconsin, deals extensively in grain, lumber, and leather, packs much pork, and manufactures a great quantity of flour and machinery. Its tanneries and immense breweries have already been mentioned Locate Racine, a smaller but important lake port.

4. Detroit and Ann Arbor

Detroit, the largest city in Michigan, is also on the Great Lakes water route. The name is a French word for *strait.* Why is that name suitable here? All vessels going east or west must pass this city, and some railroads connecting the East and the West either cross the strait at Detroit or pass under it by a tunnel. Being at the crossing of important railway and steamship lines, Detroit has become a great shipping and manufacturing center. It deals in grain, wool, pork, and ores from the West, and makes iron and steel goods. The rapid increase in the use of the automobile for business and pleasure has led to the building of automobiles and to the manufacturing of automobile parts on a large scale. In Detroit this industry has grown to great proportions. Here there are a number of noted automobile manufacturing plants employing thousands of skilled workmen and producing thousands of automobiles and carloads of automobile parts daily.

5. Cleveland and Toledo

On the lake shore in Ohio the chief cities are Toledo and Cleveland. The former has extensive flour mills and iron manufactories; and the latter, which is a much larger city, being even larger than Cincinnati, Detroit, or Buffalo, has an important trade in grain, lumber, and ore. The situation of Cleveland near the coal and petroleum fields has led to extensive manufacturing of machinery, furniture, and other goods. Much petroleum is refined here, and the building of ships for the lake commerce is an important industry.

6. Cities of Indiana

In Indiana there are twenty-five cities each having a population of over ten thousand inhabitants. Five of these cities have a population of more than fifty thousand inhabitants each. These cities are all important manufacturing centers. The opportunities for transportation of raw material and manufactured products both by rail and water are excellent. Lake Michigan furnishes an entrance and outlet on the north. The Ohio River and the Wabash River on the south and southwest are open roads to commerce from the center and the southern sections of the state. The important transcontinental lines of railroads that cross the state bring these cities in communication with the Atlantic coast and the cities of the South and West.

Indianapolis is the chief city and the capital of the state. On account of its central location it was made the capital in 1824. At that time the state was young and undeveloped and the population of the town was only six hundred.

The rapid growth of Indianapolis is due to its splendid location. It is the center of an exceedingly fertile territory which has developed into one of the finest agricultural sections of the country. While the city has been growing in importance as an agricultural center its railroad facilities have also increased. It is the junction point for railroad lines from Chicago to Louisville and Cincinnati, and from Buffalo and Cleveland to St. Louis and the West. The city is also the center of an extensive electric railroad system reaching out into almost every section of the state.

The increase in population and the improvement of transportation facilities have made it possible for the city to become an important industrial center. The important industries are meat packing, the manufacturing of articles made from iron and steel, flour milling, canning and preserving, printing and publishing, and furniture making. In recent years the manufacture of automobile and automobile parts has become important. Where is the raw material for this manufacturing obtained? From what source do the cattle and hogs for meat packing come? Where are the vegetables and grain obtained? From where do the manufacturing plants obtain the steel and iron that they use?

In the central part of the state there are a

Fig. 118. — Post Office, Indianapolis.

number of very thriving industrial centers engaged in the manufacture of steel and wire, glass, tin plate, automobiles, and agricultural implements. In this section Muncie, Anderson, Marion, Kokomo, and Elwood are the most important. In this vicinity natural gas was discovered in 1886 and for many years it gave to these cities an abundant supply of fuel at a low cost. In recent years this gas supply has diminished considerably. To take its place bituminous coal, much of it from the Indiana mines, is now being used.

Still farther east on the border of the state is Richmond, an important manufacturing center in which agricultural implements, threshing machines, steel and wire fences, furniture, and automobiles are made.

In the north-central and western part of the state, in the Wabash Valley, there are a number of cities advantageously situated for manufacturing and for trade in agricultural supplies and agricultural products. Here may be mentioned Wabash, Huntington, Peru, Logansport, Lafayette, Terre Haute, and Vincennes.

Terre Haute is one of the oldest towns in the state. It is located at the point where the National Road crossed the Wabash River. The principal manufactured articles are flour, bread and bakery products, clothing and metal work.

Vincennes is the oldest city in the state. It was settled by the French in the first half of the eighteenth century.

In the southern part of the state, on the Ohio River, is Evansville, the second largest city in the state. It has an excellent river harbor extending more than two miles along the Ohio River. The city has become one of the chief interior shipping points for grain.

At some distance above the city the Green River of Kentucky empties into the Ohio. This gives to the city an opening into the Kentucky coal fields. Other important cities on the Ohio River and in Indiana are New Albany and Jeffersonville.

In northern Indiana there are a number of rapidly growing cities. Fort Wayne in the eastern part of the state is an important railroad junction and the center of trade for a large and fertile agricultural region. The city is largely interested in manufacturing, having large foundries and machine shops, lumber mills, flour and grist-mills, bakeries, and electric works. A portage across the higher ground between the Wabash and the Maumee valleys led, in the early days in this territory, to the establishment of a fort at this point. It is from this that the city takes its name.

Fig. 119. — A railway bridge across the Missouri River above St. Louis.

South Bend on the St. Joseph River, is advantageously situated on two lines of transcontinental railroads. In this city there are large automobile, carriage, and wagon works, foundry and machine shops. In this vicinity is Mishawaka, which manufactures rubber goods and automobiles. Farther east on the St. Joseph River, is Elkhart, a rapidly growing center in which printing industries and car building are important.

In the vicinity of Lake Michigan, there are a number of rapidly growing towns, many of them busily engaged in iron and steel manufacturing. Their location makes it possible for them to secure for their industries an abundance and variety of raw material. Among these cities may be mentioned Hammond, East Chicago, Whiting, Gary, Michigan City, and Laporte.

Principal cities along the rivers

1. St. Louis

(1) *Its location*

The largest city on the rivers, corresponding to Chicago on the lakes, is St. Louis, the fourth in size among our cities. It has a very favorable position in the center of the Mississippi Valley, on the Mississippi River, near the mouths of its two largest tributaries. The railway bridges across the Mississippi at this point have also had great influence on the growth of the city. It is an important shipping point both by water and by rail.

(2) *Its industries*

Like Chicago, St. Louis is one of our leading markets for grain and live stock; but, being so far south, it handles Southern products also, especially cotton and tobacco. Besides this, it is a great manufacturing center. It manufactures immense quantities of tobacco, beer, flour, clothing, iron, steel goods, and is the greatest manufacturing center of boots and shoes in the United States.

2. St. Paul and Minneapolis

At one time Chicago and St. Louis were almost the only noted markets for grain and live stock in the West; but in later years several other cities have become prominent. Two of these are the "twin cities," Minneapolis and St. Paul, both on the Mississippi River. The latter, the capital of Minnesota, is a trade center. From it the products of the West are sent east and south, while farm implements, furniture, clothing, and other articles are distributed among the smaller towns round about.

Minneapolis, only ten miles distant, is situated at the Falls of St. Anthony, which furnish splendid water power. Its location in the midst of the wheat region, together with its water power, has caused Minneapolis to become the leading flour-producing center of America. In the city are many sawmills, grain elevators, and flour mills.

Fig. 120. — The St. Anthony Falls at Minneapolis — some of the factories are seen in the distance.

3. Other cities on the Mississippi

Smaller cities on the Mississippi River waterway, between Minneapolis and St. Louis, are Winona, in Minnesota; La Crosse, in Wisconsin; Dubuque and Davenport, in Iowa; and Quincy, in Illinois. Find each. Each is important either for lumber, grain, or farming implements, or for all three combined.

4. Cities on and near the Missouri

The leading cities on the Missouri River are Kansas City in western Missouri, and Omaha, in Nebraska. Each is surrounded by a fertile farming country, which produces much grain. Each is also a market for cattle, sheep, and horses raised near by and in the arid region farther west. Being so near the ranch country, the meat-packing industries in both of these cities are gaining rapidly each year. Note that there is also a Kansas City in Kansas.

On the river above Kansas City is St. Joseph, in Missouri; and below it is Jefferson City, the capital of that state. Farther west, in Kansas, are Topeka, the capital, and Wichita. Southwest of Omaha is Lincoln, the capital of Nebraska; and across the river, in Iowa, is Council Bluffs, a manufacturing and trading center. Several cities northwest of this point are chiefly important as trade centers. Find some of them on the map. Locate Des Moines, the capital of Iowa. Of what advantage is its central position in a level farming country?

Fig. 121. — River boats on the Ohio at Cincinnati.

5. Cities in the Ohio Valley

In the Middle Atlantic States, Pittsburgh, and Wheeling, on the upper Ohio, owe their importance largely to coal and iron, and to the fact that river boats can reach them. Farther down the river is CINCINNATI, the largest river port in the state of Ohio, and a busy shipping and manufacturing center. Besides pottery this city manufactures large quantities of iron, machinery, and clothing. Across the river, in Kentucky, are COVINGTON and NEWPORT both almost a part of Cincinnati.

Farther north and east, in Ohio, are DAYTON and SPRINGFIELD, both noted for the manufacture of farm machinery. DAYTON, like Pullman in Chicago, makes a large number of cars; also cash registers and aëroplanes. COLUMBUS, the capital of Ohio, is an important trade center, and manufactures many carriages and wagons. Why should farm machinery, carriages, and wagons be manufactured in so many of these cities?

Improvements are being made in the Ohio River, and considerable work has already been done in the vicinity of Cincinnati. As a result, there is now, at all seasons of the year, a good depth of water in the Cincinnati harbor, and shipping can be carried on to advantage from Cincinnati on the Ohio and the Mississippi.

Review Questions

1. To what extent is the land level in the Central States? 2. What about forests and bowlders there? 3. Describe the temperature, giving reasons for the extremes. What is meant by a continental climate? By an equable climate? 4. What about the rainfall? 5. State the importance of agriculture. Describe the farm in Indiana, and the farm life. 6. To what extent is Indian corn raised in these states? 7. How is it cultivated and harvested? 8. What are its uses? 9. How extensively is wheat produced, and in what sections? 10. What cities have been much influenced in growth by the wheat raised in the valley of the Red River of the North? Why? 11. What fruits are grown, and where? 12. What vegetables? 13. Where is tobacco raised? 14. What are the principal domestic animals raised, and where? 15. Name other important farm products east of the arid lands. 16. What is meant by the Great Plains, and what is their extent? 17. How is irrigation carried on, and what are the products of the irrigated farms? 18. Tell about ranching; its extent; the ways in which it is carried on; and a ranchman's life. 19. What is the extent of forests in these states, and what kind of trees are there? 20. Describe the method of lumbering, and name the centers of the industry. 21. What about fishing in these states? 22. Where are the coal mines, and what is the kind of coal? Where are oil and gas found? 23. Why is gas an especially cheap fuel? 24. Locate the Lake Superior iron ore district, and tell about its importance. 25. Why must the ore be taken elsewhere to be smelted, and from what ports? 26. How is the ore loaded on to the vessels, and where is it taken? 27. What are the uses of copper? 28. What about building stones in these states? 29. Name other mineral products, and tell where found. 30. What are the leading kinds of manufacturing from the agricultural products? 31. Name the principal kinds of manufacturing from forest products, and the chief cities engaged in them. 32. What about the importance of the manufactures from oil? From ores? 33. What about manufactures from clay and limestone? 34. What conditions favor the transportation of goods? 35. Name and locate the principal cities along the Great Lakes. 36. State the chief facts about Duluth and Superior. 37. Outline the history of the region about Chicago. State the advantages of the site of the city. 38. Give an account of meat packing and related industries there. 39. What other kinds of manufacturing are prominent in Chicago? 40. What means of transportation are provided in the city? 41. How is the sewage taken care of? 42. What is said about education in this vicinity? 43. What can you tell about Milwaukee and Racine? 44. Detroit and Ann Arbor? Cleveland and Toledo? 45. Name and locate the principal cities of Indiana. 46. Name and locate the principal cities along the great rivers. 47. For what is St. Louis especially important? 48. St. Paul and Minneapolis? 49. Name smaller cities on the Mississippi River and tell of their importance. 50. Locate and tell what you can about the various cities along and near the Missouri River. 51. State the principal facts about the cities in the Ohio Valley.

Review Questions by States

Ohio (O.). 1. Name the four largest cities (Appendix, pp. 392–394). State the advantages of each location. 2. What other cities of Ohio are mentioned? For what is each important? 3. Why is there much manufacturing in this state? 4. What other industries are mentioned in the text? 5. Examine the maps (Figs. 186–219) in order to see what crops are especially important in Ohio. 6. In what ways are the cities of Ohio dependent upon New

Orleans and New York? How are the latter cities dependent upon those in Ohio? 7. Of what service to Cleveland and Toledo is the Erie Canal? 8. Draw a sketch map of Ohio like that of Maine. As you study each state, do the same.

Indiana (Ind.). 9. Examine the maps (Figs. 186–194) to see what crops are produced in Indiana. 10. What minerals are found here? 11. Which is the largest city? For what noted? 12. What other cities are mentioned? 13. What are the industries of Indiana? 14. Of what importance was the fact that a large part of this section was treeless when discovered?

Illinois (Ill.). 15. Examine the maps (Figs. 186–196) to see what crops are especially important. 16. Why is there much manufacturing in Illinois? What kinds are carried on? 17. Of what value is the lake to manufacturing? 18. State the reasons why Chicago has developed so greatly. 19. What other cities are mentioned in this state? For what is each important? 20. Which of the four states so far reviewed is the largest? Which smallest (Appendix, pp. 391–392)?

Michigan (Mich.). 21. What lakes does this state border? Of what advantage is this? 22. What disadvantage can you see in the fact that water separates the lower from the upper peninsula of Michigan? 23. Ice stops canal traffic in winter. What effect must this have? 24. Into what waters does this state drain? Contrast this drainage with that of the other states. 25. Where are most of the large cities? Why there? 26. For what is each important? 27. Give the reasons for the location of Detroit. 28. What are the important products of Michigan?

Wisconsin (Wis.). 29. Which is the largest city in this state? For what important? 30. What other cities are mentioned in the text? What is done in each? 31. Compare Wisconsin with Michigan in relief; in mineral products; in crops; in the size of cities. 32. What effect must the lakes have upon the climate? Would this influence be greater or less than in Michigan? Why? 33. If there were coal beds in northern Wisconsin, what effect might the coal have upon Chicago, Cleveland, and the coal mining of Pennsylvania?

Minnesota (Minn.). 34. Where does the Mississippi River rise? 35. What oceans receive the waters that fall upon Minnesota? 36. What manufacturing industries are carried on in this state? 37. What crops are raised? 38. Name the three largest cities, and tell how each is important. 39. How does the largest compare in size with Boston? With Cincinnati?

Iowa (Ia.). 40. Examine the maps (Figs. 186–196) to see what crops are raised in this state. 41. What other important industries are carried on? 42. Name the largest cities. For what are they noted? 43. Much corn is raised here; what is done with it?

Missouri (Mo.). 44. Examine Figures 186–196 to see how the crops of Missouri differ from those of Minnesota. Why this difference? 45. Why are so few large towns found in the southwestern part? 46. Name and locate the two largest cities. For what is each important? 47. What other cities are mentioned? 48. Find the population of St. Louis; compare it with that of Philadelphia and Boston. 49. Give five reasons for its great size.

Kansas (Kan.). 50. Why are the cities in the eastern part? 51. What are the industries of the West? Why? 52. What are the leading crops in Kansas (Figs. 186–196)? What other industries are important? 53. Name the principal cities. For what is each noted?

Nebraska (Neb.). 54. How do the industries of Nebraska compare with those of Kansas? Why? 55. How are these states alike in regard to location of cities? 56. What cities in Nebraska are mentioned? 57. For what is Omaha noted?

North and *South Dakota* (N.D. and S.D.). 58. These two states once formed the territory of Dakota. Suggest reasons for making two states out of the one territory. 59. Compare the industries of the two states with those of Nebraska and Kansas. 60. Look at the corn and wheat maps (Figs. 186 and 188) to see where most wheat and corn are produced. Is North Dakota more or less important than Kansas as a corn-producing state? Answer the same for wheat. Why is this so? 61. Of what advantage would it be to Fargo if a deep river extended from that city to Duluth? 62. How do the Black Hills increase the wealth of South Dakota?

General Review Questions

63. Which state is the largest in this group (Appendix, pp. 391–392)? Which smallest? Compare each of these in area with Pennsylvania; with Texas. 64. Which of the Central States has most inhabitants (Appendix, pp. 391–392)? Which fewest? Compare each of these in population with New York; with Texas. 65. Find the largest ten cities (Appendix, pp. 392–394).

Suggestions

1. Find how much earlier in the fall frosts come in Minneapolis than in Memphis. 2. How do farms that you have seen differ from the Ohio farm described in the text? 3. How does the wind often help ranch cattle to obtain food in winter? 4. What are some of the ad-

ventures that cowboys experience? 5. Why are coal and brick especially valuable in a prairie country? 6. Visit a brickyard, and write a description of brickmaking. 7. See how long a list you can make of articles manufactured partly or wholly from copper. 8. Do the same with regard to lead. 9. How are the advantages of the location of Chicago somewhat similar to those of Atlanta? 10. Make a drawing of the great water route from Duluth to New York City, and put in the leading cities located upon it. What states border on this route? 11. Make a drawing of the Mississippi, Missouri, and Ohio rivers, and include the leading cities. What states do these rivers border or cross? 12. Make a sketch map of the Central States, including the principal lakes, rivers, and cities.

6. Western States

Map study

1. Compare this group with each of the other groups in relief (Fig. 124); in area, and in population (Appendix, pp. 391–392). 2. Which is the largest state? Which the smallest? How does each of these compare in size with Pennsylvania? With Texas? 3. What becomes of the water of the Humboldt River? 4. Name the five largest rivers. Where does each rise, through what states does it flow, and where does it empty? 5. Name the principal mountain ranges; the plateaus (Fig. 124). 6. Where are the largest cities? Why there? 7. Find the Yosemite and Yellowstone parks. 8. Name the states having a seacoast. 9. Name those states whose waters drain mainly or entirely into the Pacific; into the Atlantic; into the Great Basin.

Early history

While the pioneers were settling the prairies of the Central States, almost nothing was known about the Far West. The Spanish had taken possession of the southern portion, and many of their names, such as New Mexico, Los Angeles, and San Francisco, are still to be found there. The northern portion, called Oregon, was claimed by English-speaking people, and there was a great immigration to the Willamette Valley in 1843.

Discovery of gold in California

In 1848 gold was discovered in the stream gravels of California. The discovery of gold quickly drew tens of thousands of people from the East to California, so many that it was able to enter the Union as a state in 1850; and, as the search for the precious metal was carried farther and farther, the entire West soon became explored and settled. Railways were built across the mountains (Fig. 216), and many industries, such as farming, lumbering, and manufacturing, have followed mining. Indeed, in many sections these industries are now much more important than the mining.

Surface of the country

1. The three principal mountain systems

The Western States are made up almost entirely of plateaus and mountains. Most of the surface is more than a mile above sea level, while some mountain peaks are two miles or more in height.

The extreme eastern portion is a part of the Great Plains which reach to the very base of the *Rocky Mountains*. These mountains (Fig. 25) extend entirely across our country, into Mexico on the south, and Canada on the north. They consist of a large number of ranges and ridges, which reach their greatest height in Colorado. A long distance farther west, and almost parallel with the Rockies, is another system of mountains, called the *Sierra Nevada* in California and the *Cascade Ranges* in Oregon and Washington. Still farther west, and close to the coast, is a third system, known as the *Coast Ranges*, some portions of which rise directly out of the ocean. The highest peak in these mountains is Mount Whitney, in California, the loftiest mountain in the United States proper.

2. The valleys between

Between the Rocky Mountains and the Sierra Nevada-Cascade ranges is a broad valley dotted with numerous short mountain ridges, extending north and south. There is a plateau at each end, and a broad basin of interior drainage between, in which there are a number of salt lakes. It may be divided into three parts (Fig. 25): (1) The great *Columbia Plateau* of Idaho, Oregon, and Washington, on the north; (2) the *Colorado Plateau* of Arizona and Utah, on the south; and (3) the *Great Basin* of Utah and Nevada between the two. The numerous short mountain ranges in the Great Basin are called the *Basin Ranges*.

Between the Sierra Nevada-Cascade system and the Coast Ranges there is an area of lowland (Fig. 25). In California, Oregon, and Washington this forms a fertile valley; in Washington it is partly occupied by Puget Sound.

3. The volcanoes, and their influence

Throughout much of this Western country volcanoes were once very active. Indeed, some of the loftiest peaks are extinct volcanoes. Among these are Mount Rainier (also called Mount Tacoma) (Fig. 122), within sight of TACOMA and SEATTLE, Wash.; Mount Hood, not far from PORTLAND, Ore.; and Mount Shasta, in northern California. Other fine volcanic cones in this region are Mount Baker, Mount Adams, and Mount St. Helens. Recently Mount Lassen in northern California has again become an active volcano, and smoke and ashes are frequently thrown thousands of feet into the air.

Lava covers hundreds of thousands of square miles in these Western States, and its decay has produced a soil which is very fertile. The lava has also had an important effect upon the deposit of valuable minerals. Veins of gold and silver usually occupy cracks in the rock, caused by the breaking of the rock layers while the mountains were forming. Through these cracks water passes, often heated so hot by the buried lava that it is able to dissolve mineral matter and carry it along. As the water cools, on nearing the surface, it cannot hold all of this mineral in solution, and therefore deposits a part of it on the walls of the cracks. In this way many valuable veins of metal have been slowly formed, and it is for those that thousands of miners are now searching. Hot water still flows from the earth in many parts of the West, the section most noted for this being the Yellowstone Park. In this water there is much mineral matter in solution, and in some cases even small quantities of gold.

The climate

1. Extent of arid lands

In the East there is little variety in the climate, even over large sections; but in the West the variety is great. Even in a single state there are often great differences. Nearly everywhere, excepting in the Northwest and on the mountain slopes and plateaus, it is so dry that no agriculture is possible without irrigation. Almost one-fifth of the United States is unfit for agriculture without irrigation, and most of this arid land is in these Western States.

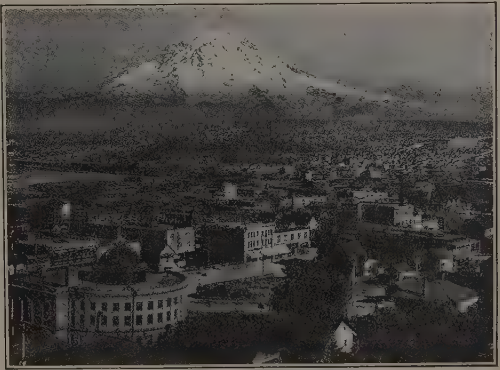


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FIG. 122. — Mount Rainier from Tacoma. This beautiful snow-capped peak is 60 miles away.

Parts of southern California, Nevada, Utah, and Arizona, and smaller portions of each of the other states, are true desert. Near the western shores of Great Salt Lake, for example, not a tree nor even a shrub is to be seen for miles and miles (Fig. 125). The entire surface is covered by a glistening whitish substance called *alkali*. In other regions dreary wastes extend for hundreds of miles, broken only by a few cacti and other arid land plants, by rocky ledges, and by occasional mountain peaks.

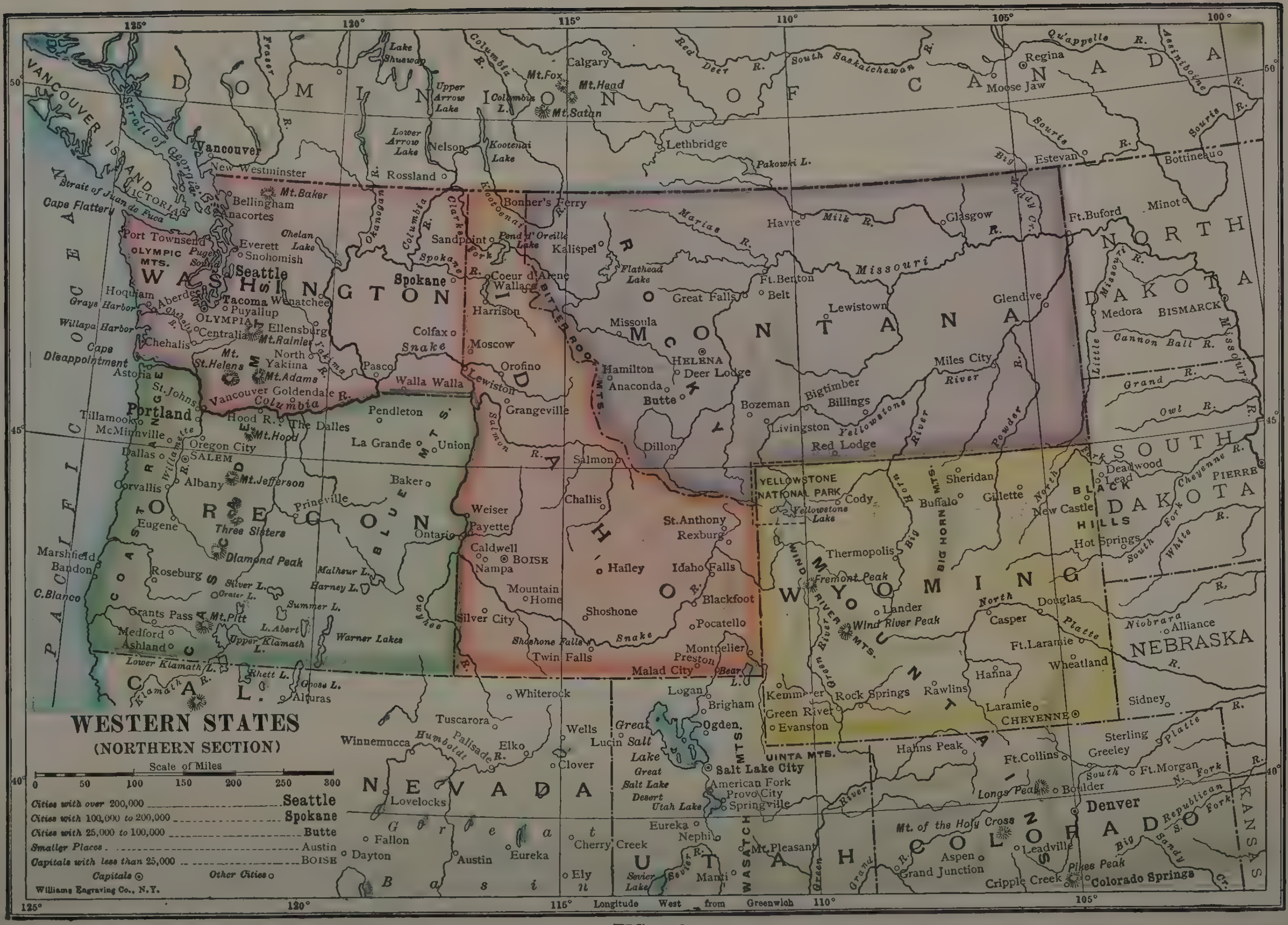
WESTERN STATES
(NORTHERN SECTION)
Scale of Miles
0 50 100 150 200 250 300
Cities with over 200,000 Seattle
Cities with 100,000 to 200,000 Spokane
Cities with 25,000 to 100,000 Butte
Smaller Places Austin
Capitals with less than 25,000 BOISE
Capitals ⊙
Other Cities ○
Williams Engraving Co., N.Y.
Longitude West from Greenwich
125° 120° 115° 110° 105° 100°
50° 45° 40°
DOMINION OF CANADA
VANCOUVER ISLAND
PACIFIC OCEAN
WASHINGTON
OREGON
IDAHO
MONTANA
WYOMING
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
COLORADO
UTAH
NEVADA
CAL.
Great Basin
Seattle
Spokane
Tacoma
OLYMPIA
Portland
SALEM
BOISE
HELENA
Butte
CHEYENNE
Salt Lake City
Denver
BISMARCK
PIERRE
VICTORIA
Vancouver
OLYMPIC MTS.
CASCADE MTS.
COAST RANGE
BLUE MTS.
BITTER ROOT MTS.
ROCKY MTS.
BIG HORN MTS.
WIND RIVER MTS.
UINTA MTS.
WASATCH MTS.
BLACK HILLS
YELLOWSTONE NATIONAL PARK
Great Salt Lake
Great Salt Lake Desert
Columbia R.
Snake R.
Missouri R.
Yellowstone River
North Platte

FIG. 123.

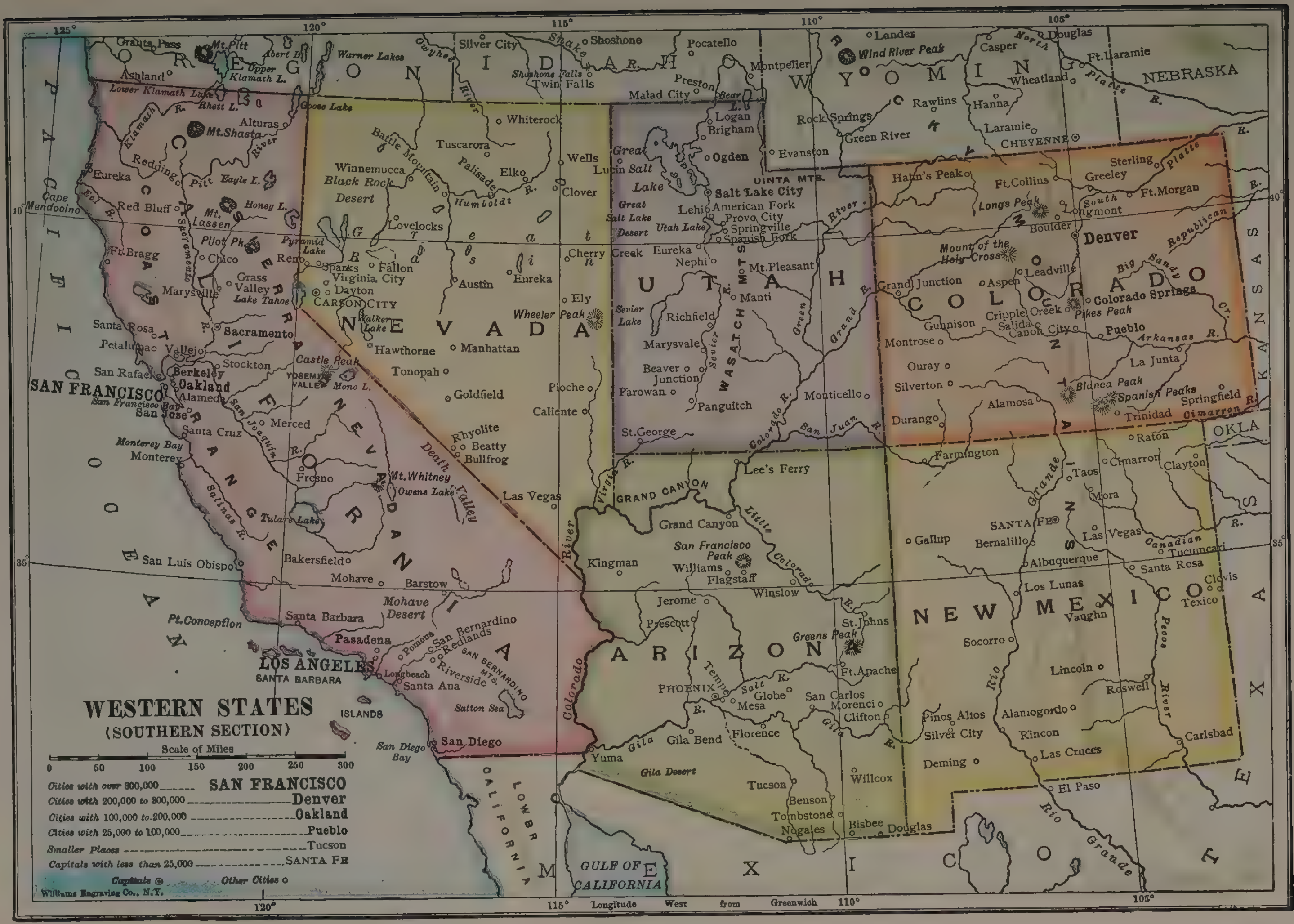
WESTERN STATES
(SOUTHERN SECTION)
Scale of Miles
0
50
100
150
200
250
300
Cities with over 300,000 SAN FRANCISCO
Cities with 200,000 to 300,000 Denver
Cities with 100,000 to 200,000 Oakland
Cities with 25,000 to 100,000 Pueblo
Smaller Places Tucson
Capitals with less than 25,000 SANTA FE
Capitals ◎
Other Cities ○
Williams Engraving Co., N.Y.
Longitude West from Greenwich
125°
120°
115°
110°
105°
40°
35°
PACIFIC OCEAN
OREGON
IDAHO
WYOMING
NEBRASKA
KANSAS
OKLA
TEXAS
MEXICO
CALIFORNIA
NEVADA
UTAH
COLORADO
ARIZONA
NEW MEXICO
LOWER CALIFORNIA
GULF OF CALIFORNIA
Great Basin
SAN FRANCISCO
LOS ANGELES
Oakland
Denver
Salt Lake City
SACRAMENTO
CARSON CITY
CHEYENNE
SANTA FE
PHOENIX
Pueblo
Tucson
San Diego
San Jose
Berkeley
Alameda
Fresno
Stockton
Pasadena
Ogden
Colorado Springs
El Paso
Reno
Grand Canyon
Death Valley
Mohave Desert
Gila Desert
Great Salt Lake
Great Salt Lake Desert
Lake Tahoe
Salton Sea
Mt. Shasta
Mt. Lassen
Mt. Whitney
Pikes Peak
Longs Peak
Mount of the Holy Cross
Spanish Peaks
Blanca Peak
San Francisco Peak
Wheeler Peak
Wind River Peak
Colorado R.
Rio Grande
Gila R.
Sacramento R.
San Joaquin R.
Humboldt R.
Snake R.
Arkansas R.
Pecos River
WASATCH MTS.
UINTA MTS.
SAN BERNARDINO MTS.
SANTA BARBARA ISLANDS
Yosemite Valley

FIG. 123.

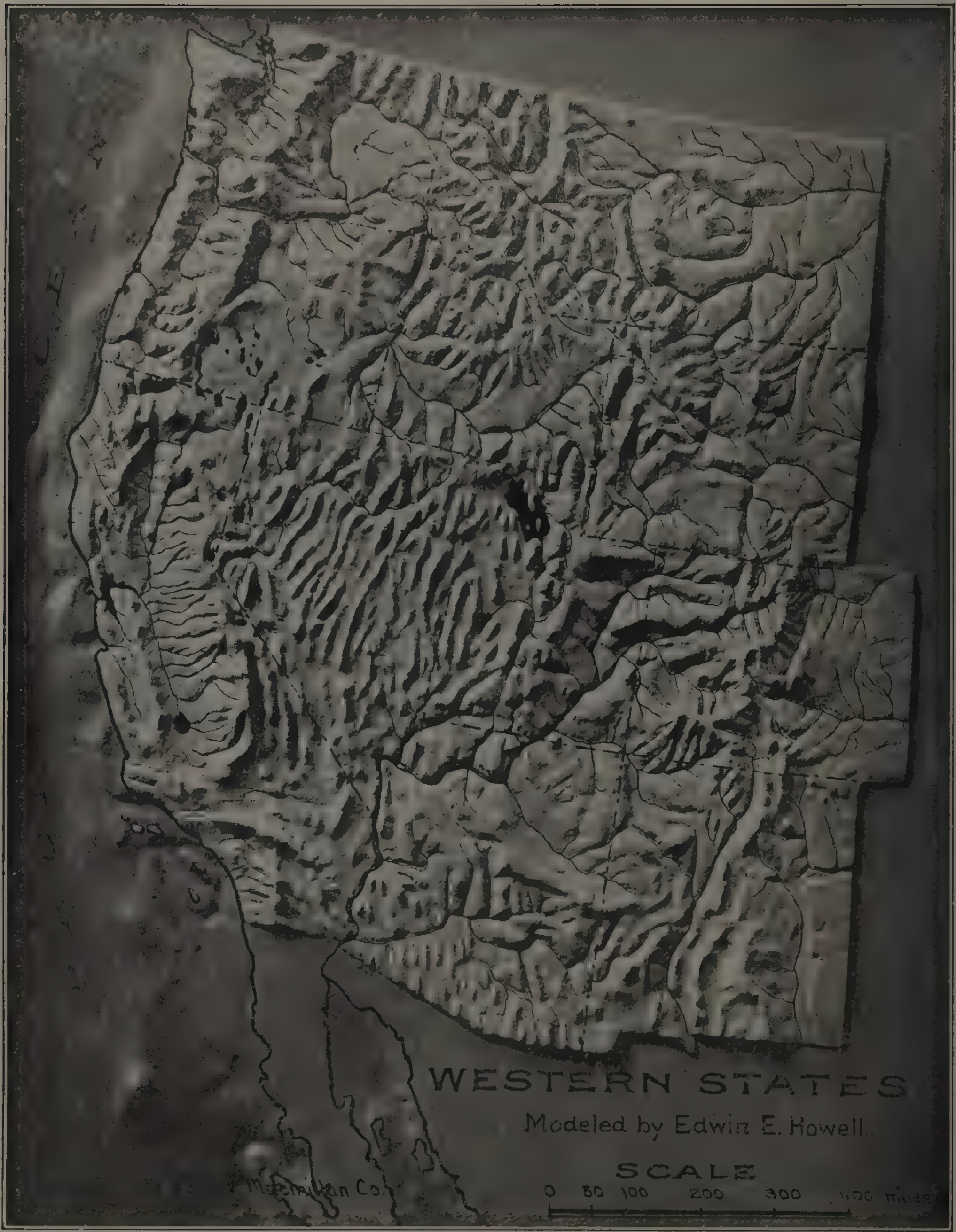

Fig. 124. — Relief map of the Western States.

2. The well-watered sections

(1) The northwestern coast

Along the northwestern coast the damp west winds from the ocean bring so much vapor that the rainfall is heavy. Indeed, along the coast of Washington the rainfall is heavier than in any other part of the United States, the greatest amount falling in winter. There is also plenty of rain in western Oregon and the northern half of California.

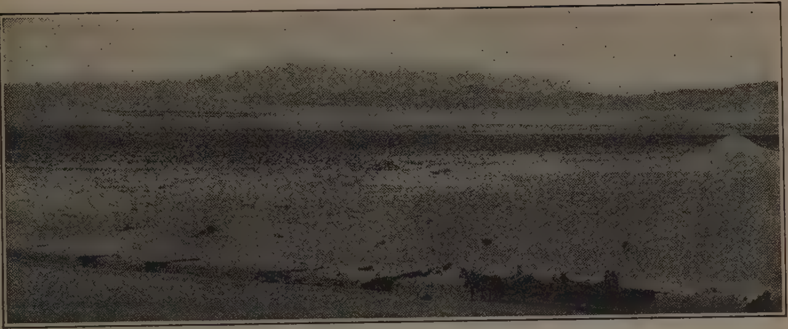

FIG. 125. — The desert near Great Salt Lake in Utah.

Being robbed of its vapor in crossing the mountains, the air descends on the eastern side quite dry; and there agriculture without irrigation is possible in only a few sections, as in the high mountain valleys and in the wheat district of central and eastern Washington and Oregon.

(2) The higher plateaus, and the mountains

Throughout the West the higher mountains and plateaus receive enough rain for crops. That this is true is proved by the numerous large rivers which have their sources there. Name and locate those flowing from the Rocky Mountains into the Mississippi. Trace the Rio Grande and its principal tributary, the Pecos; also the rivers that empty into the Pacific Ocean. Although long, many of these rivers are shallow, and during the summer season some, like the Rio Grande, almost disappear in the middle part of their course. Others, like the Columbia and Sacramento, are navigable in parts of their course.

(3) The oases

Finally, in the desert itself are many oases where water for irrigation is at hand. By aid of water, even the most barren land may be transformed to a beautiful garden (Fig. 126).

Every one of the Western States contains mineral deposits

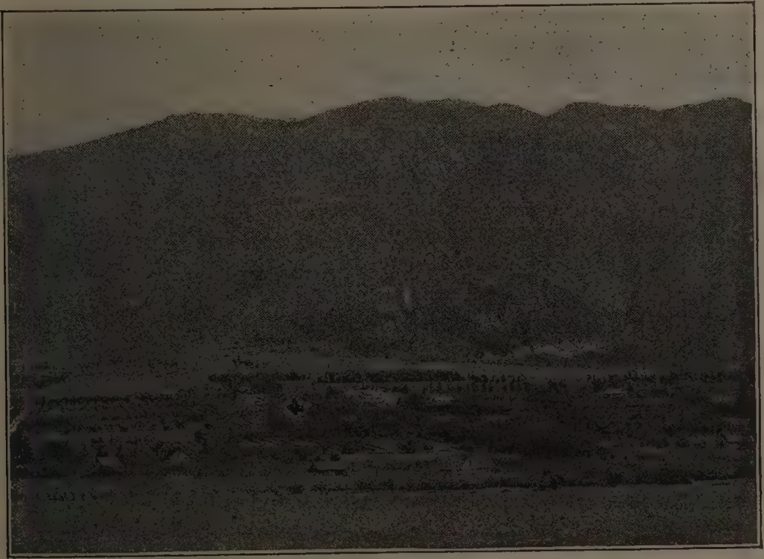

FIG. 126. — This view, near Pasadena, California, shows the barren arid lands, in the midst of which are extensive orange groves, irrigated by water from the mountains.

of some kind, such as gold, silver, copper, lead, mercury, petroleum, and coal. This region is now one of the most important mining districts in the world.

Mining

1. Kinds of minerals, and ownership of mining lands

2. Methods of mining gold

Much gold has been discovered in the river gravels. In many regions it is easy to get the gold out of these gravels, but in some places these ancient stream beds have been covered with a thick layer of hard lava. Then it is necessary for the miners to tunnel under the lava in order to obtain the gold.

(1) Panning the gold

The first miners obtained the gold in a very simple manner. Placing some of the stream gravel in a pan of water, they rocked it back and forth in such a way as to cause the heavier particles of gold to sink to the bottom of the pan, while the lighter minerals on top were washed out and thrown. Most of the gold was in very small flakes, but sometimes the miners found large lumps of gold, called *nuggets*, worth hundreds of dollars. This method of washing away the gravel in pans was called "panning" the gold.

Much gold has been obtained from the gravels of California and other Western States. For example, even the gravel out of which some of the streets of Helena, Mont., are built has been washed for gold.

(2) The common method now

The method by which most gold is now obtained is to dig into the solid rock, as in the case of other metals. The shafts and tunnels follow the veins from which the gold in the gravels came. In the veins, the metal is found mixed with other minerals which are of little or no value. This mixture forms gold ore, and there is so little gold in such ore, and it is in such small grains, that one may spend days in a mine looking for it without *seeing* any. The gold ore, like other ores already studied, must be crushed and melted before the gold itself can be obtained.

3. Noted mining districts

(1) In Nevada

One of the most remarkable gold-mining districts in the world is that of the Comstock Lode at Virginia City, Nev. The vein is irregular in richness, some parts, called "bonanzas," containing much gold and silver, while elsewhere it is quite barren. So much metal has been obtained from this single vein that Nevada at one time produced more silver than all the other states put together, and more gold than any other state in the Union. So many people moved there then that Nevada territory became a state in 1864; and Virginia City, though in the midst of a desert, grew to be a thriving city.

With the discovery of many rich new mining fields, and the reopening of old mines, new towns have sprung up, and Nevada is again the center of great mining activity and one of our most important mining states. It is one of the leading states in the production of gold and silver. Tonopah, Goldfield, and Bullfrog are important mining towns. These and other cities are now more important than Virginia City.

(2) In Colorado

At present Colorado produces more gold than any other state, and it ranks fourth in the production of silver. In addition to these metals, Colorado produces much copper, lead, and iron. Among the mountains, one sees many mines; but one of the most noted mining districts is near Leadville, a city at an elevation of over ten thousand feet above the sea. Gold, silver, and lead are mined in this locality.

Another well-known mining camp in Colorado is Cripple Creek. A few years ago there was no town here, and the gold ore, which later proved so valuable, was not recognized as ore by the prospectors. Finally, when some one discovered the gold, thousands of people rushed in from all directions, and a city sprang up almost in a day. This has been true in many other places. Sometimes the cities have continued to grow, but if the mines have given out, the mining centers have been abandoned almost as rapidly as they grew.

Iron is found in several of the Western States, but as yet it is not mined to a great extent except west of PUEBLO, in Colorado.

(3) *In Montana*

The western half of Montana is another noted mining section, and this state is now second in the production of silver and copper, while it also supplies much lead, gold, coal, and other mineral products, including precious stones. HELENA has already been mentioned (p. 112), but no portion of the state is now so important for mining as the region in and near BUTTE. There the principal metal is copper, although some gold and silver are mixed with the ore. More copper has been produced at the Butte mines than in any other mining district in the world. The mines are very extensive, reaching several thousand feet into the earth, and having tunnels through which one might wander for days without finding his way out.

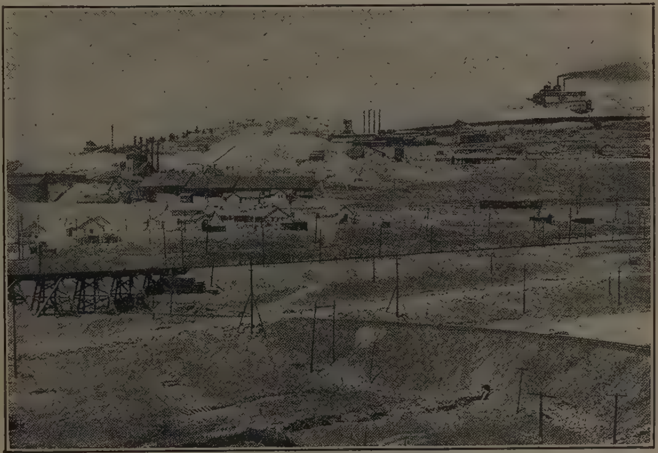

FIG. 127. — A view in the mining district of Victor, Colorado. There are mines beneath these buildings, and the waste rock removed from the tunnels forms huge banks near them.

(4) *In other Western States*

The mining industry of Arizona is also very important, much copper, silver, lead, and gold being produced. Arizona now ranks first among the states of the Union in the production of copper. One of the largest cities in the territory is TUCSON. Another large city is BISBEE, the center of a noted copper mining region and rivaling Butte, Mont. There is much smelting at DOUGLAS, and all these cities, as well as PHŒNIX, are trade centers for neighboring mines and irrigated farms.

There is much mining, especially of gold, silver, copper, and lead, in each of the other Western States. California ranks second among our states in the production of gold, Utah third in silver and lead, and Idaho second in lead and fourth in silver. The Cœur d'Alene mining district of northern Idaho is the most important silver-lead district in the country. SPOKANE, in Washington, is the trade center for this noted mining region, which has had much to do with the remarkable and recent growth of this city.

In addition to the metals mentioned, these states, as well as Wyoming and New Mexico, produce large quantities of other valuable minerals. There are many important mining towns and mining camps in each of these states.

4. Coal, petroleum, and other minerals

Coal, some of it of excellent quality, occurs in many sections of the West, being mined in almost all these states. Colorado produces more than any other Western state, ranking eighth among the states of the country in this production. But other Western States produce considerable amounts: among these Wyoming and Washington are next in importance to Colorado. Nearly every one of the Western States has coal beds which are bound to be of great value in the future.

Petroleum is another valuable product in the West. Enormous quantities have been found in California, and that state now produces more than any other in the Union. So much is produced, in fact, that it is used on railway engines, in place of coal.

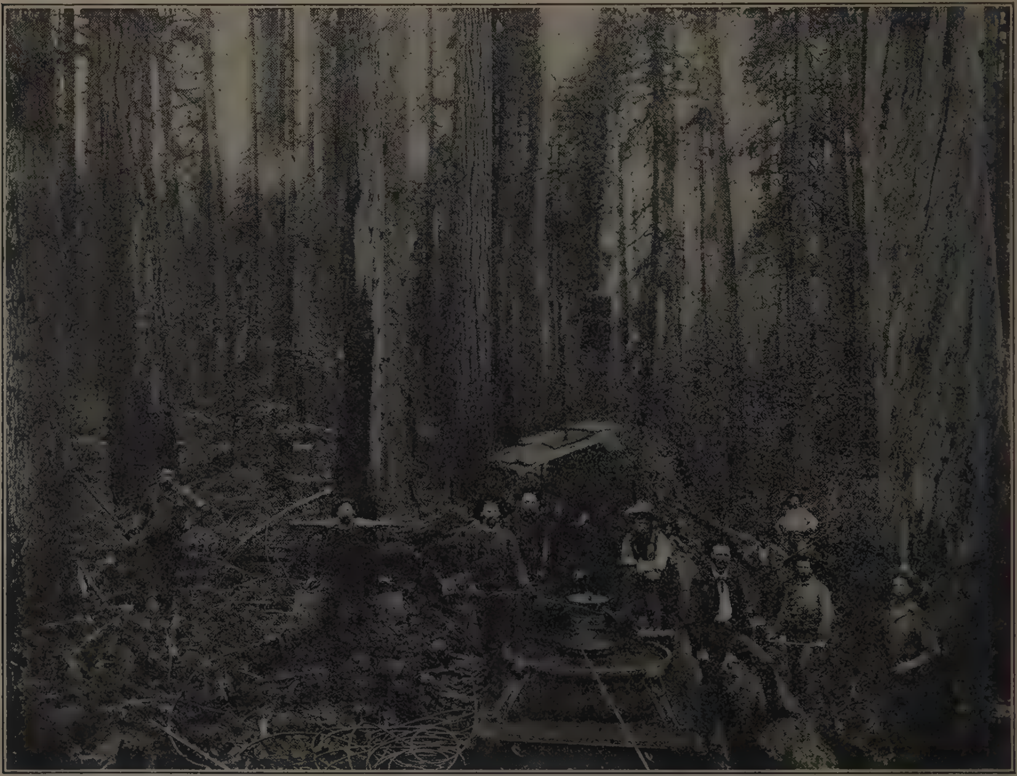

Fig. 128. — Lumbermen at work in the forest of western Washington. Note in the foreground the donkey engine used for drawing logs.

There are many other mineral products in the Western States, including building stones and semi-precious stones, which are obtained in California, Arizona, Colorado, Utah, Nevada, and other states.

Lumbering

1. The special demand for lumber

Mining gives rise to much lumbering in many parts of the West. The Butte mines alone consume millions of feet of lumber per year. In the mines heavy, upright timbers are placed together, on each side of a tunnel, to prevent the rock from caving in. Because of the great pressure upon them, timbers more than a foot through are often broken.

2. The present general demand

But in recent years, the rapid destruction of the forests of other sections has made the timber supply of the Western States especially valuable, and created an increasing demand from all parts of the country.

The most noted lumber region, however, is on and near the western coast from central California northward. Here, in the damp, equable climate, the giant redwood,

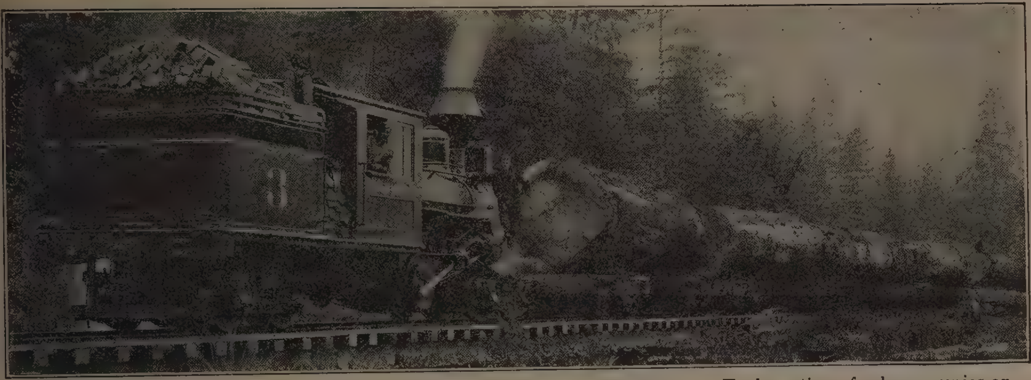

Fig. 129. — A train drawing lumber out of the forest of western Washington. Each section of a log occupies an entire car, and all the logs in the picture are parts of a single tree.

fir, cedar, and spruce trees grow to great size, the redwood being confined to California, where there are extensive forests of these *big trees*. There are immense forests of giant trees all the way from central California to Canada. While the logs in Maine and Michigan are rarely more than two or three feet through, many in Washington and Oregon are from six to fifteen feet in diameter, and some in California are very much larger.

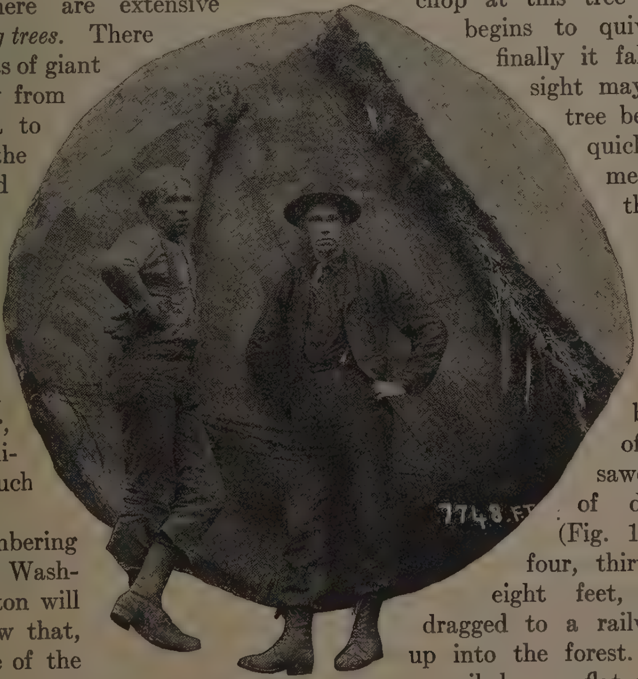

Fig. 130. — The end of a log cut from the forest of western Washington. You can see how large it is by the men standing in front of it.

3. Method of lumbering A visit to a lumbering camp in western Washington will show that, owing to the size of the trees, and to the climate, the work is carried on very differently from lumbering in Maine (p. 30). The men are able to work both winter and summer. They select a tree, which perhaps towers upward for two hundred feet, that is, higher than most church steeples. Two men saw and chop at this tree until the giant begins to quiver, and when finally it falls, a wonderful sight may be seen. The tree bends slowly over, quickens its movement, then falls to the ground with a mighty crash, breaking good-sized trees in its way as if they were twigs.

After the branches are cut off, the tree is sawed into sections of different lengths (Fig. 130), as twenty-four, thirty-two, or forty-eight feet, and these are dragged to a railway which leads up into the forest. There the logs are piled upon flat cars and taken to the mills, a single section sometimes occupying an entire car (Fig. 129). From five to fifteen thousand feet of lumber, or enough to build a small house, may be obtained from a single large tree.

4. What is done with the logs and lumber

Many of the logs go to Tacoma and Seattle, where there are enormous sawmills. Such enormous quantities of lumber are obtained from these forests, and so cheaply, that the lumber is sent even as far as the Atlantic coast. The Northwest is now one of the greatest lumbering regions in the country, and all the cities there have some share in the industry. Much lumber is sent away by boat from Portland and Astoria, but even more goes from the cities of Puget Sound. Besides Tacoma and Seattle, Everett and Bellingham are noted for their lumber industry. With so much lumber it is natural that there should be extensive manufacture of shingles, doors, and other wooden articles.

5. Forest reservations

A great deal of the forest of the West is on government land, and to prevent it from being wasted, our government has set apart what are called *forest reserves*. That is, the forest is kept, or *reserved*, by the government, so that no one can cut down the trees without permission. In this way a supply of timber will be preserved for use in the future; for it is hardly fair that we should leave no timber for those who come after us. In addition, the forests are of value in preventing the rapid running off of the water in streams; thus they help to regulate the supply of water for manufacturing, irrigation, and other purposes.

Fishing

Although there are few fishing banks along the western coast of the United States there are some on which valuable food fish are found. Other kinds of fish are caught along the coast, or are found swimming in the surface waters; and the oyster thrives in the shallow waters at the head of Puget Sound.

Large numbers of cod and halibut are caught on the banks and along the shores of British Columbia and Alaska, and many vessels go there, especially from Seattle. Not all the fish that are caught are eaten by the Western people; some are shipped to other parts of the country, even to Eastern cities. Fresh halibut, kept on ice in refrigerator cars, are sent from Seattle to many places in the East.

The most important fishing industry, however, is that of salmon catching. This fish, like the shad of the East (p. 31), spends most of its life in the ocean, but passes up the rivers to spawn, or lay its eggs, in fresh water. As they are going toward and up the rivers, the salmon are caught in great numbers, and some are shipped away in ice, even across the continent. Others are sent to the numerous canning factories at Astoria and other points along the lower Columbia, and to Bellingham and other points on Puget Sound, where they are packed in cans.

Agriculture
1. In the Northwest

There is extensive farming in Washington and Oregon, east of the Cascade Ranges, one of the finest farming regions in the United States. This is a noted wheat country, like the valley of the Red River of the North, and some of the farms are even larger than the one described on page 85. Mile after mile, in Oregon and Washington, are fields of waving grain, which, because of the very fertile soil, yield enormous crops. Hay, barley, corn, oats, fruits, vegetables, and farm animals are also raised. During the harvest season the air in most sections is so dry that both grain and hay may be left out of doors for weeks with little danger of being spoiled by rain. Walla Walla, Wash., Lewiston, Ida., and Pendleton, Ore., are situated in this great wheat region.

Near the eastern base of the Cascade Ranges the climate is so dry that irrigation is necessary and there, as in the Yakima Valley, is found a wonderful fruit country. On the western side of the Cascade Ranges there is abundant rainfall, and there fruit, vegetables, and grains, as well as hops, are extensively produced. The entire Pacific coast region, from Canada to Mexico, is famous for its excellent fruit. The principal kinds in the Northwest are apples, pears, berries, plums, cherries, grapes, and prunes.

2. In the Great Valley of California

In the *Great Valley of California*, besides these fruits, there are groves of oranges, lemons, olives, and figs, as well as other trees which thrive only in warm climates. SACRAMENTO, STOCKTON, and FRESNO are the leading cities of the Great Valley, which, throughout its whole length, is occupied by a succession of wheat fields, vineyards, orchards, beet fields, and nut and fruit groves; but in the central and southern portions, where the rainfall is light, irrigation is provided as described in a later section. California fresh fruit is shipped in enormous quantities to Eastern cities, while dried and canned California fruits are to be found in most of our grocery stores.

There are a few other, smaller sections where the rainfall is sufficient for agriculture; but the only way in which farming is possible in most other parts of the West is by means of irrigation.

3. In Colorado and Wyoming, by irrigation

(1) How irrigation is planned near Denver

The influence of irrigation is well illustrated in the region near DENVER, which lies in the midst of an arid plain. This plain is crossed, however, by the South Fork of the Platte River, from which a ditch, as large as a canal, is led out upon the plain (Fig. 131). The river itself has a rapid fall, but just enough slope has been given the ditch to allow the water to flow. Thus the ditch soon runs on a higher level than the river, and the land between it and the river is lower than the ditch.

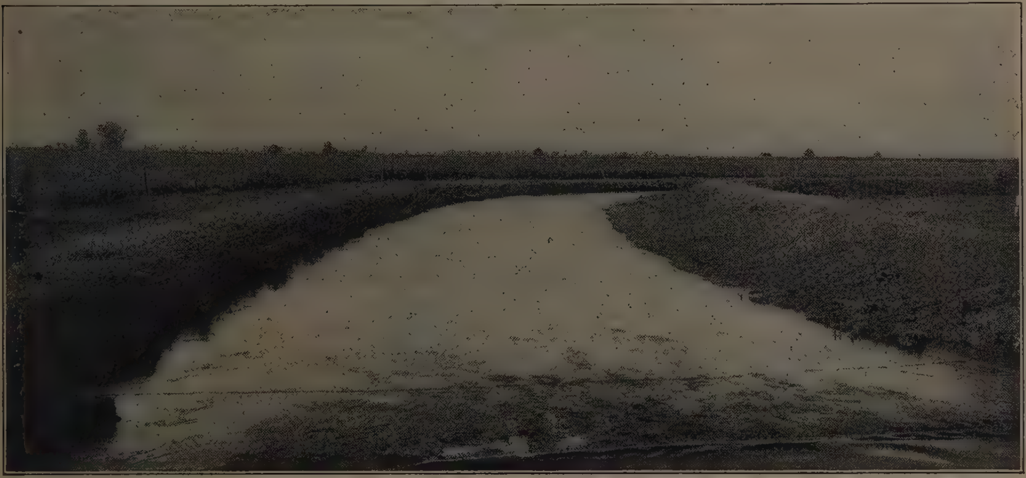

FIG. 131.—An irrigating ditch near Denver. The water is led from a river, and by it the land, otherwise useless for agriculture, is made to yield rich harvests.

Water from the ditch may then be led out over these fields to irrigate them. For this purpose ditches branch off from the main canal, and each of these is divided and subdivided to supply farms along its course. When a field needs water, one of the smaller ditches is tapped and the field is flooded; or else the water is led into little furrows, a few feet apart (Fig. 132). The method followed depends upon the kind of crop that is under cultivation. As there is danger that the supply of water may not last through the summer, reservoirs are built to store the water of the spring freshets; and when needed, this is allowed to flow into the ditches.

(2) *Expense of such irrigation, and its advantages*

Of course such an arrangement is expensive, and each farmer must pay for his water at a certain rate, as each tenant of a house in a city pays for his water or gas. That a farmer can afford to pay for water, however, is well shown in this case; for on the upper side of the ditch, which cannot be reached by the water, the land is fit only for grazing, while on the lower side there are rich fields of grain, vegetables, and alfalfa. The latter, like clover and hay, is fed to stock. It is one of the most important crops of the arid regions, where there is much demand for fodder for cattle, hogs, sheep, and horses.

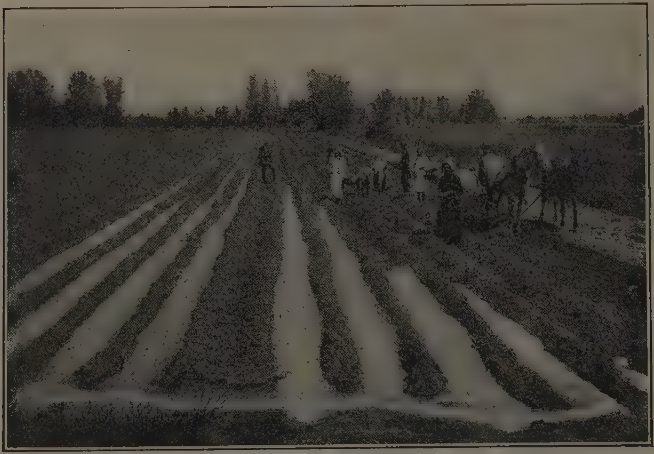

Fig. 132. — A farmer irrigating his field. The water from the irrigating ditch is allowed to run along the furrows and thus wet the seeds that have just been planted.

Without irrigation, crops could not be grown in this vicinity. It would then be necessary to bring farm products from Kansas, Nebraska, and other states, a distance of several hundred miles. It is evident, therefore, that irrigation must have had a great influence on the settlement of the West. Without it DENVER and PUEBLO would not be so important as they are; and because of the expense of carrying food so far, scores of mining towns would not exist. Wherever the waters of the rivers are led out over the fields, people form settlements, and even towns and small cities. That is the case at GREELEY, in Colorado; CHEYENNE and LARAMIE, the principal cities in Wyoming; and scores of other places.

4. In Utah, by irrigation

One of the best farming districts in the arid lands is in Utah. A large part of that state was once a desert. But extensive areas have been entirely changed by the Mormons, a religious sect founded in New York, in 1830, by Joseph Smith.

Under the leadership of Brigham Young these people migrated into the then unknown West and settled a few miles from Great Salt Lake. Here they commenced to build SALT LAKE CITY, which is now one of the most beautiful cities in the country. They also began to raise crops by irrigation, and to plant fruit trees, and thus converted portions of the desert waste into beautiful gardens.

There are now in Utah many who do not accept the Mormon religion. Agriculture is no longer the sole industry. As you have already learned (p. 113), many rich mines have been opened in this state. There are numerous busy towns and cities, the one next to Salt Lake City in size being OGDEN, which lies north of the capital.

5. In central and Southern California, by irrigation

(1) *The climate here, and the method of irrigation*

Central and Southern California is a third section noted for its extensive irrigation. The region is far south, and its shores are bathed by warm ocean waters, so that the climate is delightful. But the land, although very fertile, is arid by nature, and in places almost a desert. Thus there is every

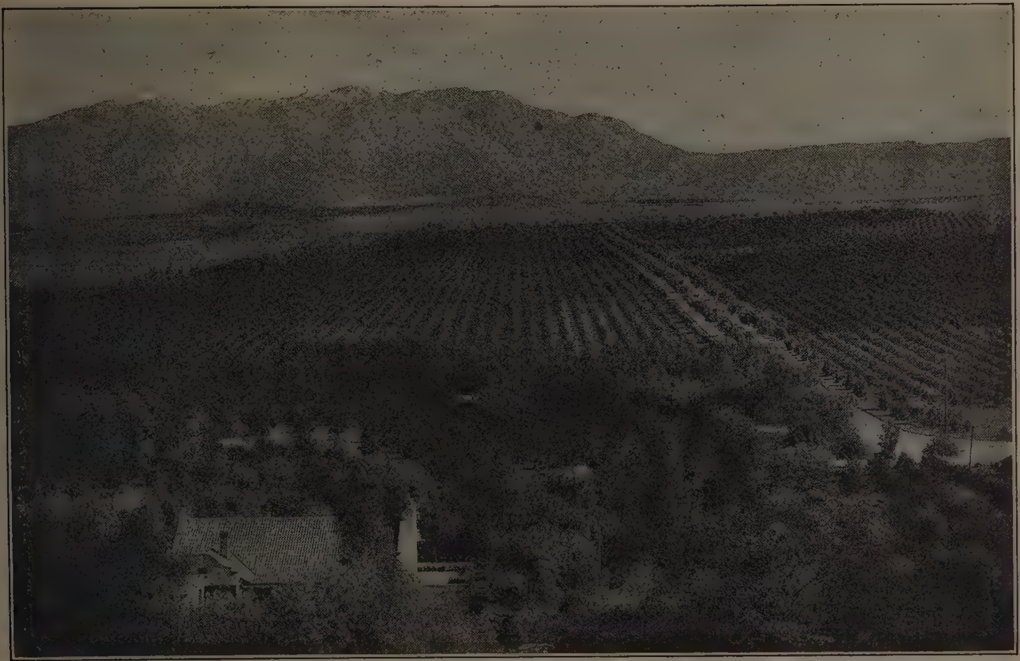

FIG. 133. — An orange grove in Southern California on land which not many years ago supported only the sparse vegetation of an arid climate.

gradation in California, from farms, orchards, and vineyards that could not exist without irrigation, to those, already described, which require no irrigation.

(2) The products

Oranges, lemons, peaches, pears, grapes, figs, olives, walnuts, almonds, and many other kinds of fruits and nuts, now grow here in abundance. Among the fruits the most common is the seedless navel orange. In these beautiful valleys nearly every home has its orange trees, and in many cases the house is entirely surrounded by them (Fig. 133).

Thousands of persons from the East were first attracted to California by the mild and healthful climate; then, seeing the opportunity for fruit raising, they planted orchards and orange groves. In those valleys which are too cool for oranges, thousands of acres are devoted to other fruits, such as prunes, apricots, grapes, pears, and apples. Land that a few years ago was worth, at best, only a few dollars an acre, now supports flourishing groves of fruit.

(3) Care of the fruit, and what is done with it

The groves of all kinds are planted in straight rows, and the ground is kept so clean by frequent plowing that scarcely a weed is to be seen. In this respect the groves present a very different appearance from the orchards, overgrown with grass and weeds, that are often seen upon farms of the East.

The winter season is the harvest time for oranges, which are picked from about the middle of November until February or later (Fig. 134). They are cut from the trees, sorted according to size, then packed in boxes and shipped away.

Immense quantities of peaches, prunes, apricots, grapes, figs, and other fruits are dried, usually by exposure to the sun. In the Eastern States fruit would soon decay

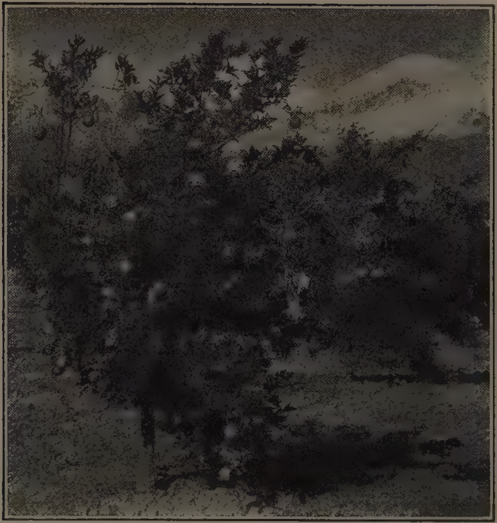

Fig. 134. — An orange tree in Southern California. Notice the snow on the mountain only a few miles away.

if left out of doors, but in the sunny climate of the arid lands it dries quickly. Much fruit is also canned, and many grapes are made into wine. California wine is of such high quality that it is sent not only to the East, but even to Europe.

The value of irrigation is well shown here. Before irrigation was introduced into Southern California, this region could support very few people. Now, in Los Angeles and vicinity, there is a population of over five hundred thousand.

6. In other irrigated sections

The description of these few places serves to show the importance of irrigation in the West. It is not to be understood, however, that these are the only noted irrigated sections, for there are many others. Most of the largest and best known are along the large rivers. For example, irrigation is extensive along the Yellowstone and Missouri rivers and their tributaries in Montana; along the Snake River and its tributaries in Idaho; along the Yakima River (Figs. 136 and 137), and other streams tributary to the Columbia River in Washington, Oregon, and Idaho; along the Gila and Salt rivers in Arizona; along the Rio Grande and Pecos rivers in New Mexico; and along the Sacramento, San Joaquin, and other rivers in California. The map shows that there are many irrigated sections.

The irrigation of Arizona deserves especial mention, partly because of the extensive irrigation works that the government has constructed there, and partly because of the climate. One of the greatest irrigation works undertaken is the Roosevelt dam in the Salt River, which will supply water for a large area near Phœnix. The climate near this city and Tucson is such that even semitropical fruits are produced. Here are raised oranges, lemons, grapefruit, figs, olives, pomegranates, and even dates. The warm, dry climate also makes this region an important health resort.

So important is irrigation that it is being introduced wherever possible, and every year new irrigation systems are being built,

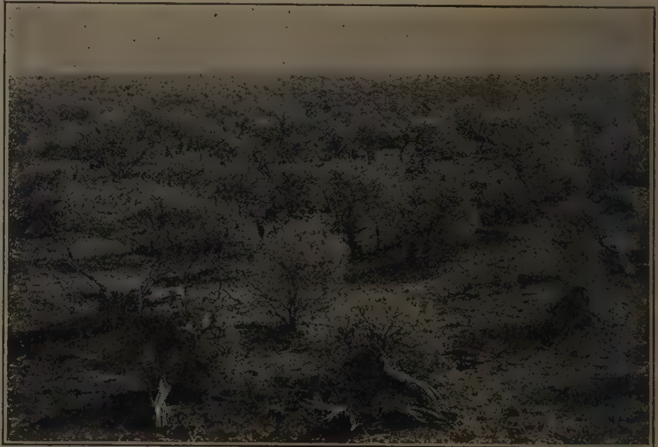

Fig. 135. — Desert land in the Yakima Valley, covered with the worthless sagebrush. Such land without irrigation is of almost no value; but compare this picture with Figure 136.

some of them at great expense. Since much of the arid region is public land, the United States government is aiding in this work. There is, in fact, a special department of the government in charge of it, and every year millions of dollars are being spent in this way.

7. Government work in irrigation

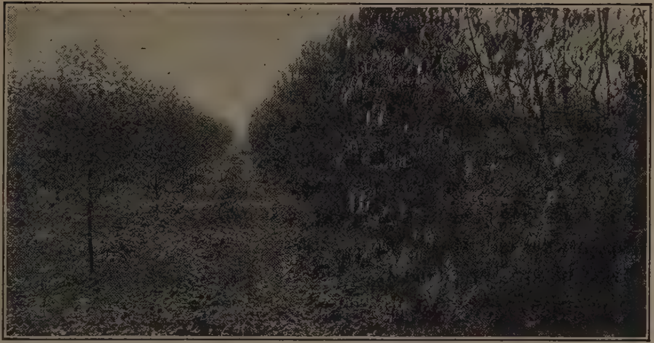

Fig. 136. — Desert land in the Yakima Valley which only a few years ago was covered with sagebrush like that in Figure 135. Now, being reached by an irrigation ditch, it supports a flourishing young peach and apple orchard and is worth $1000 an acre.

Enormous dams are built (Fig. 137), forming large lakes in the mountain valleys, and these are filled in spring when the snow melts. Then, in summer, when the crops need water, it is let out of the reservoirs into the irrigation canals. In this way the amount of farm land in the arid West is being greatly increased. This is one of the most important works in which our government is engaged.

8. Ranching

(1) *Kinds of animals raised*

There is so little rainfall in the arid portion of the West that only a small part of the land can be irrigated. This leaves most of the country for grazing; and wherever there is water enough for the animals to drink, cattle, horse, and sheep ranches are found. In some parts, especially where the grass is scanty, herds of goats are raised.

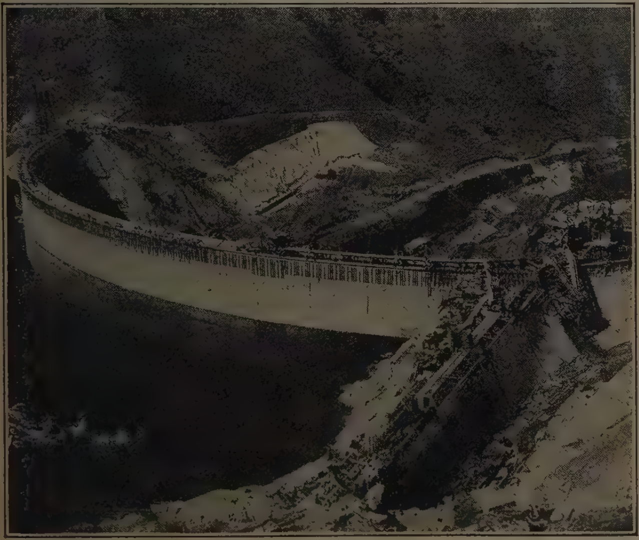

Fig. 137. — Arrowrock Dam near Boise.

(2) *How sheep ranching is carried on*

The manner in which cattle ranching is carried on in Dakota was described on pages 90–92, and much the same plan is followed for cattle and horses in all the Western States. Sheep ranching is somewhat different, as may be seen from the ranches about BILLINGS, Mont.

A good-sized sheep ranch has from twenty-five thousand to forty thousand head of sheep. These, like cattle, may feed partly upon government land, or the "range," and partly on land fenced in and owned by the ranchman. During the coldest winter weather, when the snow may be so deep that the sheep cannot obtain food, they are often driven into protected *corrals* and fed on alfalfa. The fierce winds of the open plains help them, however, by drifting the snow and thus leaving open patches where they can find grass.

When the sheep are feeding on the range, one man, with a dog (Fig. 138), can herd twenty-five hundred; and if he has a horse to ride, he sometimes takes care of five thousand. Selecting a spot near water for a camp, the herder drives his sheep out each morning, and back at night, going each day a distance of two or three miles from camp. When the grass is eaten in one place, the camp is moved; then, from the new point as a center, they wander out as before.

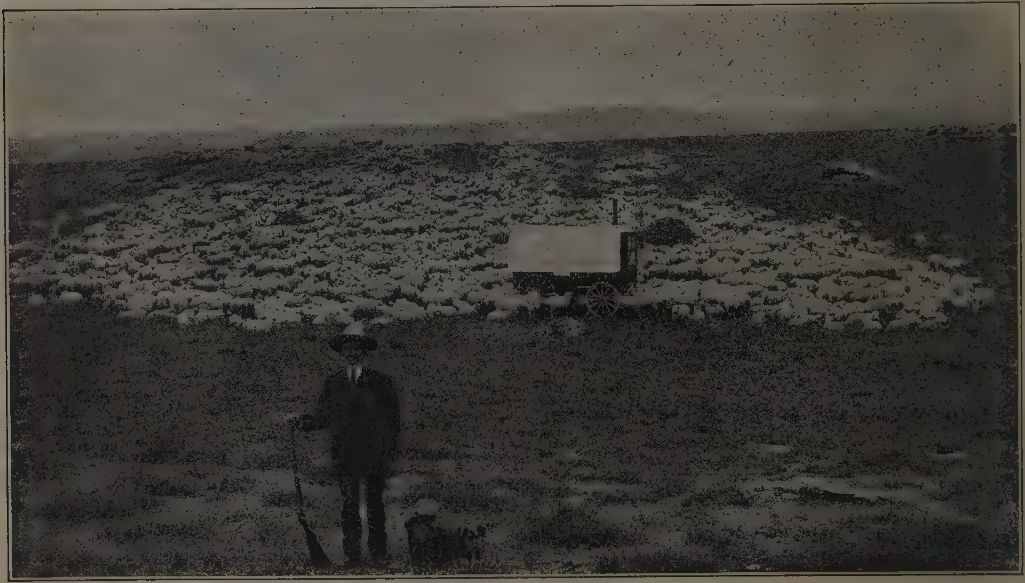

Fig. 138. — A Montana sheep herder with his dogs and his flock.

The life of the herder is extremely lonely, both day and night being spent with the sheep. Once a week a man brings him food; and for weeks, and even months at a time, the only company he has, aside from his sheep, is his dog, and possibly his horse.

(3) *Sources of profit*

After the winter is over, the first income to the ranchman comes from the sale of the skins, or pelts, of sheep which have died during the cold weather. He expects to lose about one sheep in twenty each year from this cause.

The next harvest comes from the wool. Men who make it their business to shear sheep travel in squads of about twenty-five. They erect sheds and pens near some sheep center, such as BILLINGS, and shear all the sheep that are brought to them. Sometimes sheep are sheared at the ranch, but many ranchmen prefer to drive them near to a market, before they are sheared. This saves the expense of hauling the wool to the railway station, and besides, the sheep graze on the way to and from the market.

In the Southwestern States sheep are often sheared twice a year; but farther north it is done only once, and then as near the month of June as possible. Can you suggest a reason for choosing that time? After the wool is cut, it is pressed into bales and shipped to various markets in the East. Where should you think it might be sent, and for what purposes used?

From July on, many sheep are sold for

mutton. Those that are from three to five years old, and that have already borne a quantity of wool, are usually selected for this purpose. The hides are useful for leather and the bones for fertilizing the soil.

Manufacturing

1. Extent of the manufacturing

A newly settled country has little manufacturing. Consequently many manufactured articles that are needed in the West must still be brought from the East. As in the Southern States, however, rapid changes have been going on, and the West is fast becoming an important manufacturing region. Already in some parts, as in Colorado and on the Pacific coast, there is a great deal of manufacturing.

There is every reason for believing that this progress will continue; for the West has great resources, including immense deposits of coal and petroleum for fuel, as well as abundant water power. Furthermore, the demand for manufactured articles is increasing, because many people are settling in this section.

2. Principal kinds

One of the most extensive kinds of manufacturing in the West consists in separating the metal from the ores. After the ore is taken from the mines, it must usually be crushed, the worthless parts must be washed out, and the remainder sent to the smelters, where the metal is extracted by a difficult process. The machinery for crushing and smelting is so expensive that ores from many mines are sent to one place, and must sometimes be carried a long distance. For example, the mines near LEADVILLE send their ore to that city, but many mines in Colorado ship ore to the smelters at DENVER and PUEBLO.

All the ores must be treated in some such way. Thus the crushing and smelting of ore is an important industry in many of the Western cities. The metals thus obtained are also manufactured into various articles in the larger cities.

The manufacture of lumber and articles made of wood, such as paper, furniture, and farm implements, is already extensive in some places, and is rapidly increasing.

As we have seen, the West is, to a large extent, a fruit and wheat region. On that account the canning and drying of fruits, and the making of flour and other products from wheat, are very important industries. The abundance of fish gives rise to the canning industry in certain places, and the great numbers of cattle and sheep supply hides and wool, not only for shipment to Eastern factories, but also for manufacture in the West.

Transportation of goods

The development of manufacturing in the West has been made possible largely by the building of railroads. There is a remarkably large number of railroads here, considering the difficulty of building them and the recent settlement of the country. On Figure 216 observe that each of the great cities on the coast is connected by rail, not only with the others, but also with the East by one or more transcontinental railways. Count the railroads that cross the Western States, and learn their names. When the Union Pacific, the first of these, was completed, in 1869, it was thought to be a wonderful work, and of enormous importance; but now that there are so many railroads, people are inclined to overlook their great value.

Railroads are of especial value in the interior of the West, where there is very little opportunity for transportation by water. The scarcity of navigable streams is partly due to the fact that the rivers are few and shallow, and partly to the fact that many of them descend rapidly to the sea, and therefore have rapids and falls that prevent navigation. Notable exceptions are the lower Sacramento and the Columbia, on which river boats carry on an extensive commerce.

Although harbors are not numerous, there are several excellent ones, sufficient to carry on traffic with all parts of the world.

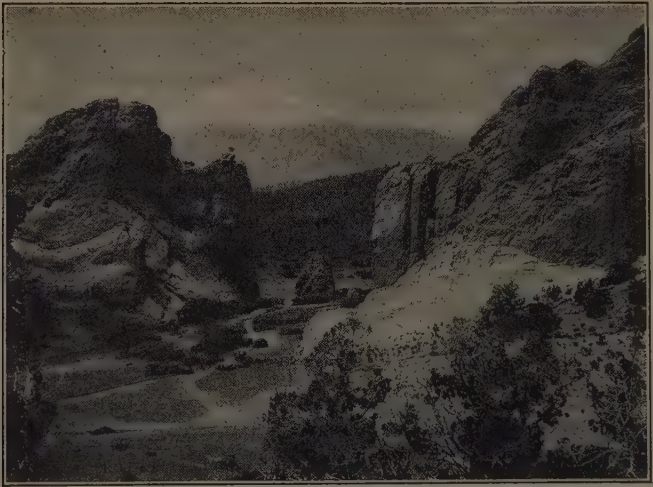

FIG. 139. — Pikes Peak from the Garden of the Gods, near Colorado Springs.

Leading cities in the interior

Large inland cities in the Western States are few in number, partly because there are no important waterways. There are, however, so many railways that some large cities have developed, especially at the junction of important trunk lines.

1. Denver and Colorado Springs

The greatest of the interior cities is DENVER, the capital of Colorado. This city is located on the site of a small mining camp, but its growth is chiefly due to two facts: (1) the numerous mining towns among the mountains near by; and (2) the near presence of water, which has made irrigation on a large scale possible. The first fact calls for an important trade and manufacturing center somewhere in that region, and the second makes it possible to secure food.

Denver has now become a very important railway and manufacturing center, where ore is smelted, and machinery, flour, and cloth manufactured. It is also of importance as a health resort, for the altitude of over five thousand feet and the dry climate are especially favorable to persons suffering from diseases of the lungs. COLORADO SPRINGS, south of Denver, at the base of Pikes Peak (Fig. 139), is one of the leading health resorts in the country.

2. Pueblo

PUEBLO, a trade and manufacturing center, is situated south of Denver, where the Santa Fe line meets the Denver and Rio Grande Railway. Here much ore is smelted, and iron goods are manufactured (Fig. 140). It is the nearness to coal and iron ore which makes the latter industry possible.

3. Spokane

SPOKANE, in eastern Washington, is situated on the Spokane River at a point where there is a large waterfall. This supplies abundant water power, so that there is much manufacturing. Since the city lies in the midst of the fertile wheat region of eastern Washington, flour milling is of special importance, as at Minneapolis. From the forests of Idaho it receives lumber, and, as already mentioned, it

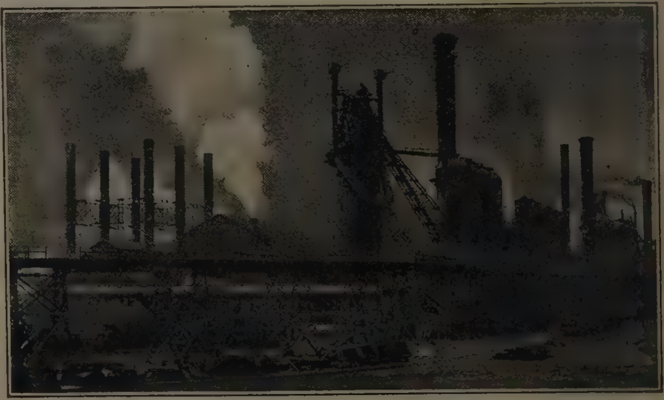

FIG. 140. — Blast furnaces and steel works at Pueblo, Colorado.

has been greatly benefited by the rich mines of the near-by Cœur d'Alene district. Spokane is also an important railway center and distributing point for a wide area of country. It has grown very rapidly, and is now second in size among the interior cities. Two other cities in the interior of Washington are Walla Walla in the southeast and North Yakima in the Yakima Valley.

4. Butte, Anaconda, and Great Falls

Some of the ore mined at Butte was formerly crushed and reduced in smelters within the city limits. But most of it is now sent to the smelters at Anaconda. There is another large smelting plant at Great Falls. These cities are also centers for the distribution of electric power developed along the Montana rivers. Even one of the transcontinental railroads has now been electrified for several hundred miles through Montana.

5. Other cities and towns in the interior

Several other interior cities, such as Salt Lake City and Ogden, have already been mentioned (page 118). Find others on the map. Most of these owe their importance chiefly to mining, farming by irrigation, and grazing. Name the capitals of the Western States. Which of these have been mentioned, and in what connection? Locate Boise, the capital of Idaho, a city in the midst of a fertile irrigation district.

Leading cities on the coast

1. San Francisco and cities near by

(1) *Names and locations of these cities*

The largest city in the Western States is San Francisco, located on a remarkably fine harbor, at the tip of the peninsula that shuts in the waters of San Francisco Bay. This harbor, like that of New York, was formed by the sinking of the coast. There are other important cities near San Francisco, the largest being Oakland, Berkeley, and Alameda. Oakland, which is much the largest, is the land terminus of several transcontinental railways and the center of large manufacturing and ship-building industries. Close to it is Berkeley, the seat of the University of California; and farther south is Stanford University. These are two of the most important universities in the West. There are others of note, however, for each of the Western States supports a state university.

South of San Francisco is San José; northeast of San Francisco, on the Sacramento River, is Sacramento, the capital of California; and east of San Francisco is Stockton, at the head of navigation on the San Joaquin River. Trace these rivers, and observe the extent of the fertile Great Valley through which they flow.

(2) *Their manufactures*

The enormous crops of wheat, fruit, and wool in the Great Valley of California suggest some of the occupations in these cities. Among them are the canning of fruit, the milling of flour, and the making of wine, and of cloth.

The mineral products in this region have led to much smelting, and to the manufacture of metal goods of various kinds. In and near San Francisco foundries and machine shops are numerous, and ship-building is a great industry. One of our best-known battleships, the *Oregon*, was built here.

Sugar refining is another prominent industry, the raw sugar being brought from the Hawaiian Islands. The refining of petroleum is still another important industry, and brewing, distilling, and the manufacture of boots, shoes, and clothing are others. San Francisco, being by far the largest of the cities in this vicinity, leads in these industries.

Not much coal is mined in California, but, since this state produces more petroleum than any other in the Union, there is an abundance of oil for fuel. Coal is easily brought by train and boat from the Washington coal fields, and in the mountains there is an abundance of water power that can be used in generating electricity.

(3) *Their shipping*

San Francisco Bay (Fig. 141) is the only gap in the Coast Ranges for hundreds of miles, either to the north or the south; and since it is one of the finest harbors in the world, it is very important as the outlet to the Great Valley and the mining regions round about it. The principal products shipped from here are gold, silver, wine, fruit, wool, grain, and the various manufactured goods just named. Some go East by rail, but many go by boat to different parts of the world. Several transcontinental railways terminate on the shores of San Francisco Bay. For all these reasons this is a great shipping point, and, as our trade increases with the Philippines, the Hawaiian Islands, Japan, China, and other countries bordering the Pacific, the amount of shipping will increase.

Many goods are sent from Stockton, Oakland, and other points on or near the bay; but San Francisco is the leading center for the shipping, as for the manufacturing.

2. Coast cities south of San Francisco

The next important harbor south of San Francisco is the port of Los Angeles, twenty miles from Los ANGELES itself, where a fine artificial harbor has been made at great expense. Still farther south is the fine natural harbor of SAN DIEGO. Estimate the distance of these points from San Francisco.

Los Angeles is one of the most beautiful cities in the country (Fig. 142). It lies in the midst of the rich orange country (Fig. 133), and there are scores of small villages, towns, and cities round about it. Among the larger of these are PASADENA, POMONA, RIVERSIDE, REDLANDS, and SAN BERNARDINO. Los Angeles is the chief distributing center for this productive region. It has had such a rapid growth that it is now the second city in size in the Western States.

3. Coast cities north of San Francisco

(1) *Portland and vicinity*

The first large city north of San Francisco is PORTLAND on the Willamette River, a tributary of the Columbia. Like New Orleans, it is situated about a hundred miles from the ocean, near the head of deep-water navigation.

Since good harbors having connections with the interior are lacking, most of the other important towns of Oregon are inland, and Portland has grown to be the chief shipping point by water, and therefore the largest city in the state. From this point wheat, flour, fruits, wool, and lumber, the leading

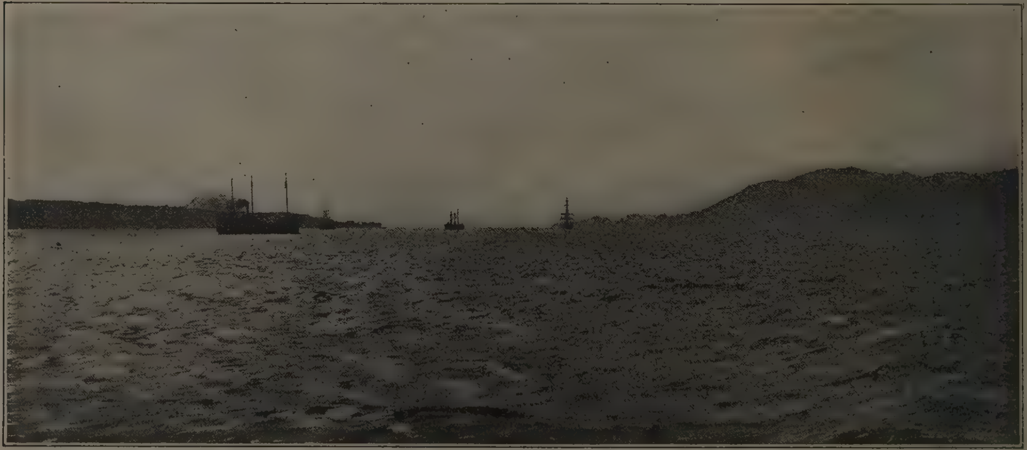

FIG. 141.—The Golden Gate, as the entrance to San Francisco Bay is called. Outside is the open ocean, while within is a broad, deep bay, protected from winds and waves and making a port where the largest ships may safely anchor.

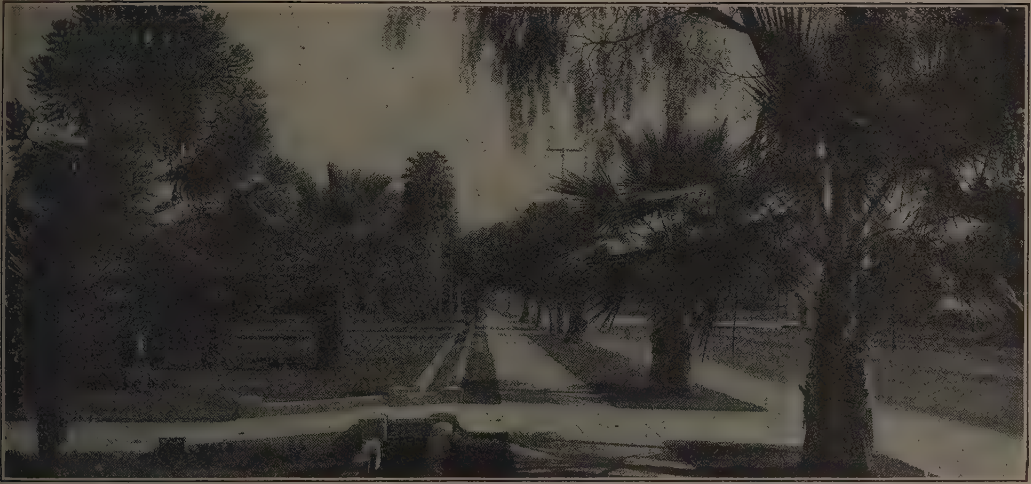

FIG. 142. — A street in Los Angeles bordered by palms and other warm-climate trees.

products of Oregon, are shipped in great quantities. Portland has extensive manufactories of woolen goods, flour, and furniture; it is one of the most beautiful towns in the West, is growing rapidly in commerce and population, its recent growth being most remarkable. It has an increasing trade with the Orient, and also with Alaska; and it is the trading center not only for Oregon but also for parts of Washington and Idaho. Portland is one of the great lumber ports in the world, and one of the leading wheat and flour shipping points on the Pacific coast.

(2) *Seattle*

Washington, unlike Oregon, has many fine harbors. Puget Sound, in fact, is one great harbor, and on its bays and arms many prosperous seaports have grown up. SEATTLE is the largest and most important city. It has the bulk of the trade with Alaska and a growing trade with the Orient, besides its commerce with the ports of other states and the surrounding country. The Panama Canal has opened a shorter way to Atlantic seaports, both American and European, which is of benefit to the commerce of Seattle as well as other Pacific Coast cities. The chief exports are lumber and grain, though iron and steel goods and other manufactured products are being brought to Seattle for export in increasing quantities. It has an important shipbuilding yard, many timber mills, and various other manufacturing industries. To Seattle comes most of the gold, salmon, and other Alaskan products, and from there the regular Alaska steamers sail, carrying many miners and other passengers, and large cargoes of supplies. The wonderfully rapid growth of the city has been due partly to this Alaskan trade. The University of Washington is located in Seattle; it is one of the largest state universities of the West.

(3) *Tacoma*

On another bay of Puget Sound is TACOMA, in an equally favorable and picturesque location. This city also has a large foreign and domestic commerce, and important manufacturing of many kinds. There is a large smelter, to which ores are sent from as far as Alaska. Near Tacoma, and plainly visible from both Tacoma and Seattle, is the extinct volcano, Mount Rainier (Mt. Tacoma). Other important seaports and manufacturing cities of Puget Sound are EVERETT and BELLINGHAM. The former is noted especially for its shingle mills; the latter, for its salmon canneries.

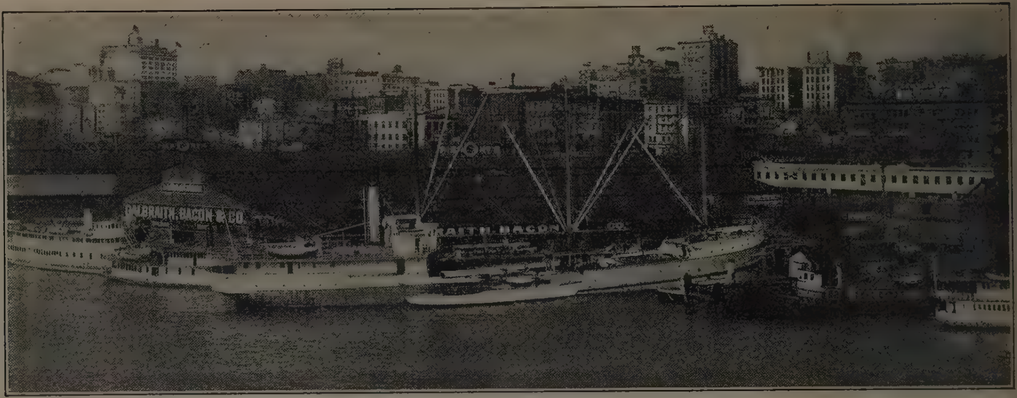

FIG. 143. — A view of a part of Seattle from the harbor.

Our newest states

When this Western country was first settled, it was divided into territories, but as the population increased, these territories have one by one been admitted into the Union as states. The last to be admitted are Arizona and New Mexico in 1912.

1. Their resources

There are many fertile valleys in these new states where there is irrigation; and, in this warm climate, wheat, corn, vegetables, alfalfa, apples, peaches, grapes, and many other crops are raised. While some of the farming is carried on by Mexicans and Indians, best results are gained by Americans who own a large part of the irrigated land. The United States government is spending large sums of money in building storage reservoirs, and in improving the irrigation systems in other ways, so that many settlers are finding valuable farm lands here.

The plateaus and mountain valleys are the seats of extensive cattle and sheep ranching, and, as we have already learned, mining is of great importance. Arizona, besides being second in the production of copper, also produces large amounts of gold and silver, while New Mexico supplies much gold, silver, and coal.

2. Their cities

The cities, though not of great size, are important distributing centers for the surrounding country, and also centers for smelting the ores. Among the most important are TUCSON, PRESCOTT, BISBEE, and PHŒNIX in Arizona, and ALBUQUERQUE, which is the largest city in New Mexico.

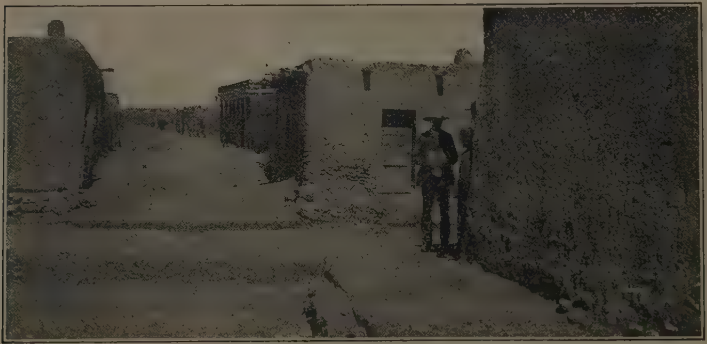

FIG. 144. — A street in a small town in New Mexico, with adobe houses belonging to the Mexican inhabitants.

Scenery in the West

1. The most noted places

In many places among the Western mountains are scenes that compare favorably with those of the Alps, which attract so many Americans abroad. Strangely formed cliffs, deep canyons, and imposing waterfalls are present without number. There are also beautiful snow-capped volcanic cones and glaciers. Many of these grand scenes may be viewed from the railway, as, for instance, the wonderful gorges and canyons through which the Denver and Rio Grande Railway winds its way across Colorado. Among all the interesting places in the West, however, are three of peculiar grandeur that are best known and have been most visited. These are the Yellowstone National Park, the Grand Canyon of the Colorado River, and the Yosemite Park.

2. The Yellowstone Park

(1) *Its hot springs and geysers*

The Yellowstone Park, chiefly in Wyoming, is a tract of land, larger than Connecticut, which the government has set aside as a national park. It is often called the "Wonderland of America." A stage road leads from the Northern Pacific Railway to the Mammoth Hot Springs on the northern side of the park. There is also a stage route from the Oregon Short Line on the western side. At the Hot Springs from openings in the hillside, heated water flows down over beautifully colored terraces, which have been built by a deposit of mineral matter carried in solution in the hot water. Farther on are boiling springs; also boiling mud springs of different colors; and here and there is a spring, called a *geyser*, from which hot water and steam now and then burst forth with great violence, even to a height of one hundred or two hundred feet (Fig. 146).

"Old Faithful," one of the most regular of these geysers, "plays" at intervals of sixty-five minutes. Then a column of steam and hot water shoots upward from one hundred to one hundred and thirty feet. Other geysers discharge at much longer periods, as two to three hours, or several days; and in some of the geysers the roar of escaping steam lasts for hours after the water has all been expelled. The outbursts are really explosions of steam, the heat being supplied from the depths of the earth. Some of the springs are on a level with the ground, so that a visitor must be on the lookout lest he step into one; others are surrounded by a rim several feet high.

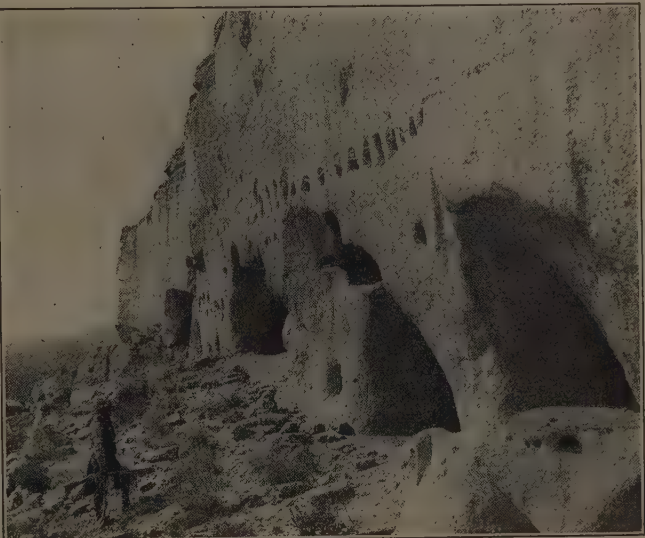
Fig. 145. — The cave dwellings of the southwest. The Indians dug these caves out of the solid rock and lived in them.

(2) *Its lake, falls, and canyon*

Beyond the geyser basins the Yellowstone Lake is reached, a beautiful sheet of water, nestled in the mountains, nearly eight thousand feet above the sea. Its waters flow northward, forming the Yellowstone River, a tributary of the Missouri.

To many persons, the falls and canyon of this river are the greatest wonders of the park. Soon after leaving the lake, the stream narrows and quickens, and the water leaps one hundred and nine feet directly

Fig. 146. — "Old Faithful" geyser in eruption.

downward. A short distance farther on it tumbles three hundred and eight feet, or almost twice the height of Niagara (Fig. 147). The river then runs between steep walls, which rise one thousand feet above it. This canyon is somewhat winding, with numerous bold cliffs jutting far out into the abyss; and from these cliffs grand views may be obtained. Far below, one sees the silvery stream, too distant to be heard as it dashes along. Across the chasm, a half mile away, dark green pines fringe the bank, and between the water and these woods are gorgeously colored rock walls, having all the tints of the rainbow.

3. The Canyon of the Colorado River

One portion of the Grand Canyon of the Colorado, in Arizona, may be reached on the Atchinson, Topeka, and Santa Fe Railway. The wonderful Yellowstone Canyon, just described, and the canyons on the Denver and Rio Grande in Colorado are pygmies compared with this.

As one first looks out into the canyon, he sees nothing but rock towers, pinnacles, many colored layers of rock, and apparently bottomless depths. When he finally reaches a point from which the threadlike stream may be spied at the bottom of the abyss, a mile below, it seems almost impossible that so little water could have wrought such mighty havoc. Yet this river has been slowly cutting its way into the rocks for thousands of centuries, and this great gash, or canyon, is the result.

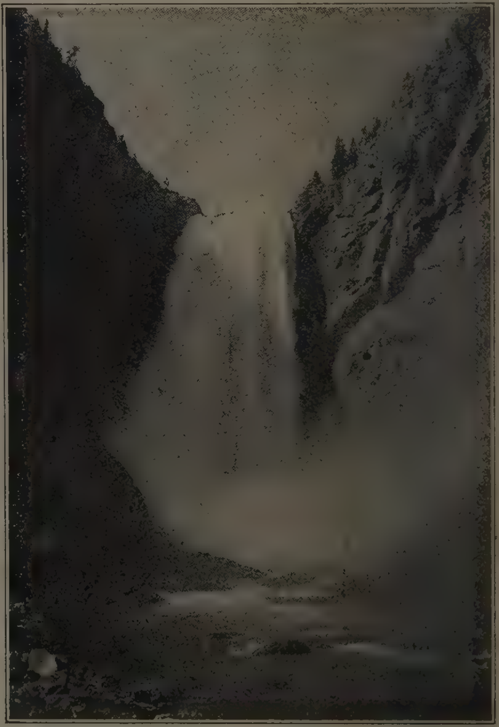

Fig. 147. — The great falls of the Yellowstone, three hundred and eight feet high.

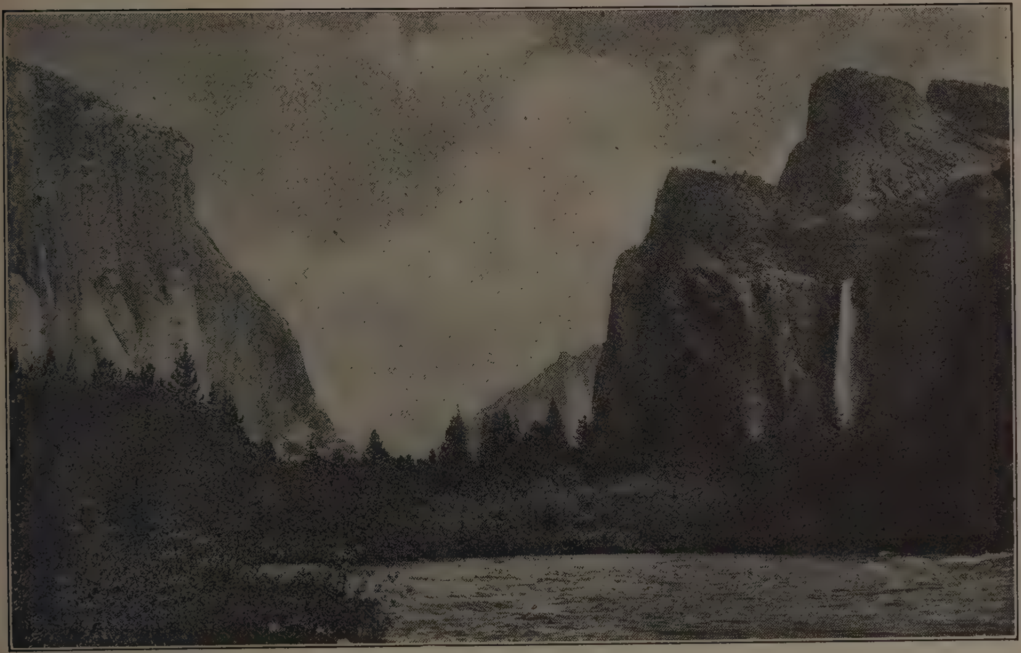

FIG. 148. — The Yosemite Valley, bordered by lofty granite precipices, over one portion of which the water leaps to form the far-famed Yosemite Falls.

4. The Yosemite Park

The remarkable Yosemite Valley, on the western slope of the Siérra Nevada Mountains, in California, presents very different views from those just described. This is the region of the High Sierras, a region of deep canyons and granite peaks, one of which, Mount Whitney, 14,898 feet high, is the highest point in the United States, not including Alaska. Some of the most magnificent views in the High Sierras are formed by waterfalls of the Yosemite Creek and Merced River, in Yosemite Park.

5. Other national parks

Other wonderful scenery in the Western States has also been set apart in National Parks, as Glacier National Park in Montana, Mt. Rainier National Park in Washington, Crater Lake National Park in Oregon, and Estes Park in Colorado. In these parks is scenery no less grand and impressive than what has been described. Every year thousands of tourists visit this wonderland of America.

Review Questions

1. Tell about the discovery of gold in California. 2. What were the effects of this discovery? 3. Name and locate the three principal mountain systems in the West. 4. Describe the valleys between. 5. Where are volcanoes found? Of what importance is the lava? 6. What about the extent of the arid lands? 7. Where are the well-watered sections? State some facts about them. 8. What minerals are found here, and what about the ownership of the mineral lands? 9. Describe the two methods of gold mining. 10. What can you tell about noted mining districts in Nevada? 11. In Colorado? 12. In Montana? 13. In other Western States? 14. Where are coal and petroleum found? 15. What use is made of timber in the mines? 16. Where is the timber obtained, and what are the principal kinds of trees? 17. Describe the method of lumbering in Washington. 18. What is done with the logs and with the lumber from them? 19. Of what importance are the forest reservations? 20. What kinds of fish are caught, and where? 21. What do you know about agriculture in the well-watered Northwest? 22. In the Great

Valley of California? 23. How is irrigation planned near Denver? 24. What about the expense of such irrigation, and its advantages? 25. What do you know about agriculture by irrigation in Utah? 26. In Southern California? 27. In other sections? 28. How is the United States government assisting in irrigation in the West? 29. How is sheep ranching carried on here? 30. What are the different sources of profit in that business? 31. What is the extent of manufacturing in the West? 32. Name the principal kinds of manufacturing. 33. What are the conveniences for transportation of goods? 34. State the principal facts about Denver and vicinity. 35. Pueblo. 36. Spokane. 37. Butte, Anaconda, and Great Falls. 38. Other cities and towns in the interior. 39. Name and locate the principal cities about San Francisco Bay. 40. What goods are manufactured in them? 41. What about the shipping at this point? 42. State the important facts about the coast cities south of San Francisco. 43. About Portland and vicinity. 44. About the cities on Puget Sound. 45. Name our two newest states, and tell about their resources. 46. Name and locate their principal cities. 47. Name and locate the places in the West most noted for scenery. 48. Describe Yellowstone Park. 49. The Canyon of the Colorado River. 50. The Yosemite Park.

Review Questions by States

Montana (Mont.). 1. What industries are carried on in the eastern part? Why? 2. In the western part? 3. Name the chief cities in Montana, and tell how each is important. 4. What two large rivers drain this section? 5. Through what states do they flow before reaching the Gulf? 6. Draw an outline map of the state and, as each of the other states is studied, do the same for that.

Wyoming (Wy.). 7. What industries are carried on in this state? 8. What cities are mentioned? In what connection? 9. Find the Yellowstone Park, and tell for what it is noted. 10. This state is represented as having little grain, on the maps showing the principal grain-producing regions (Figs. 186 and 188). Why?

Colorado (Col. or Colo.). 11. Examine Figures 204 to 209 to see what are the industries of Colorado. 12. Why is there more water for irrigation in this state than in some of the others? 13. Trace the divide between the Pacific and Atlantic drainage as it crosses Colorado. Trace it northward to Canada and southward to Mexico. 14. Name the cities in Colorado mentioned in the text, and tell how each is important. 15. Find the population of Denver (Appendix, p. 393). Compare it with that of other large cities in the Western States; and with that of New Orleans and of Buffalo.

New Mexico (N.M.). 16. What about the inhabitants? 17. What is said about the industries? 18. How large is the largest city (Appendix, p. 392)? 19. Compare it as to population with the largest city in Massachusetts; in Nevada.

Arizona (Ariz.). 20. What can you tell about the large river that crosses Arizona? 21. What cities and industries are mentioned? 22. What minerals are obtained here? 23. How does the largest city compare in size with the largest in New Mexico? In Colorado? 24. Find the population of Arizona. Of New Mexico.

Nevada (Nev.). 25. For what mines was Nevada famous? 26. Find its present population (Appendix, p. 391). 27. What about its present industries? 28. How may the government irrigation work be of special value to this state?

Utah. 29. Why is the Great Salt Lake salt? 30. What are the industries of this state? 31. What cities are mentioned? Tell about each. 32. Examine the maps, Figures 204 to 207, to see what products come from Utah.

Idaho (Ida.). 33. What metals are obtained? (See Figs. 207 to 209.) 34. What great river drains Idaho? 35. What mountain range forms the eastern boundary?

Washington (Wash.). 36. Compare the coast line with that of Oregon; of Maine. 37. What about the rainfall of this state? Compare it with that of Montana (Fig. 235). Why this difference? 38. What effect has the rainfall upon the industries? What are the principal industries? 39. What cities are mentioned in the text? What can you tell about each?

Oregon (Ore.). 40. What advantage do you see in the location of the largest city? 41. Compare it in size with Denver; New Orleans. 42. Examine the maps (Figs. 186 to 219) to see what is produced in Oregon. 43. What industries are mentioned in the text? 44. What cities are mentioned, and in what connection?

California (Cal.). 45. What about the rainfall? 46. What two rivers drain most of this state? 47. Describe the relief. 48. Name the cities mentioned; for what is each important? 49. What industries are found in this state? 50. What advantage do you see in the location of San Francisco? 51. Compare its population with that of Boston; Denver. 52. What caused the early growth of California? What effect has that had on other Western States?

53. Which state has the largest population (Appendix, p. 391)? The smallest? 54. Compare each of

General Review Questions

these two with Massachusetts and New York in population. 55. Name and locate the eight largest cities (Appendix, p. 392). 56. Which of the five groups of states has the densest population (Fig. 183)? Which the least dense? What reasons can you give?

Suggestions

1. Read about the expedition of Lewis and Clark from St. Louis to the Pacific coast in 1803–1806. 2. Find out about the early settlement and dispute about the ownership of Oregon. 3. What is the origin of the expression "to pan out"? 4. Why do the heavier rains on the northern Pacific coast come in winter? 5. Mention several of the advantages and disadvantages of having no rain for several months at a time, as in Southern California. 6. Make a collection of minerals for the school. 7. Hydraulic mining has been largely prohibited in many parts of the West. Find out how it was carried on, and why prohibited. 8. Should the ditch that is to irrigate a field skirt its upper or lower edge? Why? 9. Which is the more easily irrigated, nearly level land, or land that is rough and hilly? Why? 10. Is Southern California as liable to cold snaps as Florida? Why? 11. Make a list of articles made of wool. 12. In what year were Arizona and New Mexico admitted into the Union as states? 13. Write a story describing an imaginary visit to Southern California. 14. Make a drawing of the Western States, putting in the principal mountain ranges, rivers, and cities.

General Review Questions for United States

1. Name the principal crops of the United States, and tell in which section each is raised. (Consult Figures 186 to 196.) 2. Do the same for mineral products. 3. For other raw products. 4. For manufactured articles. 5. Name the ten largest cities in their order (Appendix, p. 392). For what is each important? 6. State some ways in which the rainfall influences the occupations of the people. 7. The temperature. 8. State clearly the influence of the sinking of the coast. 9. Of the glacial period. 10. Of the coal period. 11. Of the absence of forests on the prairies. 12. Of the rich mineral deposits in the West. 13. In what ways have the Great Lakes been of value? 14. Name some of the cities that have been benefited by them. 15. In what ways have the Mississippi River and its two largest tributaries been of value? 16. State some of the natural advantages that have aided the growth of Boston; New York; Buffalo; Philadelphia; Baltimore; New Orleans; Cleveland; Pittsburgh; Detroit; Chicago; St. Louis; and San Francisco. 17. Can you name some other cities that have also been influenced by their surroundings? 18. Which is the largest state (Appendix, p. 392)? The second in size? The smallest? The next to the smallest? 19. Which state has the largest population (Appendix, p. 391)? The second largest? The smallest? Next to the smallest? 20. What states border Mexico? Canada? Draw a map of the United States.

IV. TERRITORIES AND DEPENDENCIES OF THE UNITED STATES

Our increase of territory

At the close of the Revolutionary War the United States consisted of thirteen small colonies, extending along the Atlantic coast from Maine to Georgia. Our new nation laid claim also to the land far into the wilderness, even to the distant Mississippi. Beyond this was French and Spanish territory, while the whole Mississippi Valley was occupied by Indians.

By purchase, by war, and by treaty, we have gained possession of all the other land between the Atlantic and the Pacific, which has thus far been described; but our control does not end with the boundaries of the United States proper. In 1867 we obtained Alaska, and in 1898 we came into possession of a number of islands, some of them on the other side of the globe. Since these lands form a part of the territory controlled by our government, a study of them may come at this point.

1. Alaska

How obtained; and how the purchase was regarded

For a long time Alaska, which is more than twice as large as Texas, belonged to Russia. In 1867 that nation sold the territory to us for $7,200,000. At the time many people thought it very unwise to pay so large a sum for so distant and desolate a land. However, it has already proved of great value, and has paid for itself many times over.

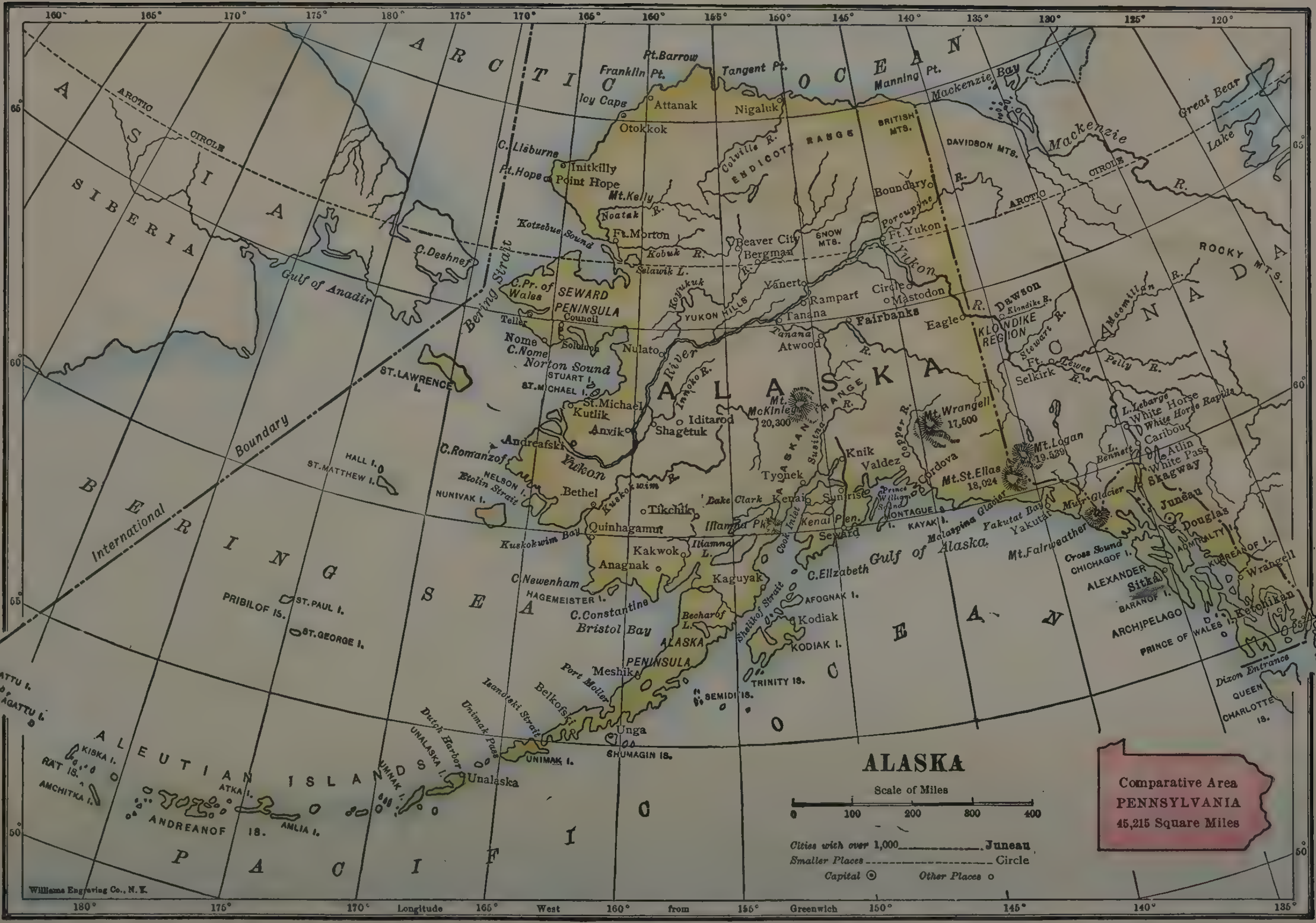
ALASKA
Scale of Miles
0
100
200
300
400
Cities with over 1,000 Juneau
Smaller Places Circle
Capital
Other Places
Comparative Area
PENNSYLVANIA
45,215 Square Miles
ARCTIC OCEAN
BERING SEA
PACIFIC OCEAN
ASIA
SIBERIA
CANADA
ALASKA
Arctic Circle
International Boundary
Bering Strait
Gulf of Anadir
C. Deshnef
ST. LAWRENCE I.
HALL I.
ST. MATTHEW I.
PRIBILOF IS.
ST. PAUL I.
ST. GEORGE I.
ALEUTIAN ISLANDS
ATTU I.
AGATTU I.
KISKA I.
RAT IS.
AMCHITKA I.
ANDREANOF IS.
ATKA I.
AMLIA I.
UMNAK I.
UNALASKA I.
Dutch Harbor
Unalaska
Unimak Pass
UNIMAK I.
Isanotski Strait
Belkofski
Port Moller
Unga
SHUMAGIN IS.
SEMIDI IS.
TRINITY IS.
ALASKA PENINSULA
Meshik
Becharof L.
Bristol Bay
C. Constantine
HAGEMEISTER I.
C. Newenham
Anagnak
Kakwok
Iliamna L.
Kaguyak
Shelikof Strait
Kodiak
KODIAK I.
AFOGNAK I.
C. Elizabeth
Gulf of Alaska
Cook Inlet
Kenai Pen.
Seward
Sunrise
Kenai
Tyonek
Lake Clark
Iliamna Pk.
Tikchik
Quinhagamut
Kuskokwim Bay
Kuskokwim R.
Bethel
NUNIVAK I.
Etolin Strait
NELSON I.
C. Romanzof
Andreafski
Yukon
Anvik
Kutlik
St. Michael
ST. MICHAEL I.
STUART I.
Norton Sound
C. Nome
Nome
Solomon
Council
Teller
C. Pr. of Wales
SEWARD PENINSULA
Kotzebue Sound
Pt. Hope
Point Hope
Initkilly
C. Lisburne
Mt. Kelly
Noatak R.
Ft. Morton
Kobuk R.
Selawik L.
Icy Cape
Otokkok
Franklin Pt.
Attanak
Pt. Barrow
Tangent Pt.
Nigaluk
Colville R.
ENDICOTT RANGE
BRITISH MTS.
Manning Pt.
Mackenzie Bay
Mackenzie R.
DAVIDSON MTS.
Great Bear Lake
ROCKY MTS.
Boundary
Porcupine
Ft. Yukon
Yukon
Beaver City
Bergman
SNOW MTS.
Koyukuk
YUKON HILLS
Yanert
Rampart
Tanana
Circle
Mastodon
Fairbanks
Eagle
Dawson
Klondike R.
KLONDIKE REGION
Stewart R.
Ft. Selkirk
Lewes R.
Pelly R.
Macmillan R.
Tanana
Atwood
Nulato
River
Innoko R.
Iditarod
Shagetuk
Mt. McKinley 20,300
ALASKAN RANGE
Susitna R.
Knik
Valdez
Copper R.
Cordova
Mt. Wrangell 17,500
Prince William Sound
MONTAGUE I.
KAYAK I.
Mt. St. Elias 18,024
Mt. Logan 19,539
Malaspina Glacier
Yakutat Bay
Yakutat
Mt. Fairweather
Muir Glacier
L. Bennett
L. Lebarge
White Horse
White Horse Rapids
Caribou
Atlin
White Pass
Skagway
Juneau
Douglas
Cross Sound
CHICHAGOF I.
ALEXANDER ARCHIPELAGO
Sitka
BARANOF I.
ADMIRALTY I.
KUPREANOF I.
Wrangell
Ketchikan
PRINCE OF WALES I.
Dixon Entrance
QUEEN CHARLOTTE IS.
Williams Engraving Co., N. Y.
Longitude West from Greenwich

FIG. 149.

The climate

Since the Arctic Circle crosses the northern part of Alaska, it will be seen that the climate of much of the territory must be severe. The winters are long and cold, and the summers short and cool.

A strip of coast land extends southeastward from the main peninsula of Alaska, and to this the west winds bring an abundance of rain and snow (Fig. 150). Since these winds blow from the ocean, they make the winters much warmer than in the northern part of the territory.

Surface of the land

1. Extent of the mountains

A large part of Alaska is mountainous, for the mountain ranges of the United States and western Canada extend northward into this territory. Among these mountains are the loftiest peaks of the continent, the highest yet discovered being Mount McKinley, which is 20,464 feet high.

2. The scenery

The snows are so heavy that most of the mountains are snow-covered throughout the year; and hundreds of glaciers descend through the mountain valleys, some even entering the sea and breaking off to form icebergs. The largest glaciers on the continent are found in this section. One of the best known of these, the *Muir Glacier*, is located not far north of Sitka.

There are so many islands along the coast that, for a thousand miles, the steamers sail between lofty, forest-covered mountain walls, with snow-capped peaks in the background, and upon waters whose surface is as quiet as a lake. It is one of the most wonderful ocean voyages in the world, and the reason for it is that the sinking of the land has allowed the sea to enter the branching mountain valleys, changing them to long, narrow arms of the sea, or *fiords*, almost cut off from the ocean.

Present thriving industries

1. Fishing

(1) *Catching of food fish*

Among the resources of Alaska, as in the case of other far Northern lands, those of the sea are especially important. On the shallow banks, and along the coast, are many cod and halibut, for which vessels now go from Seattle and ports farther south. These fish are caught in large quantities, some being sold even in the Eastern States.

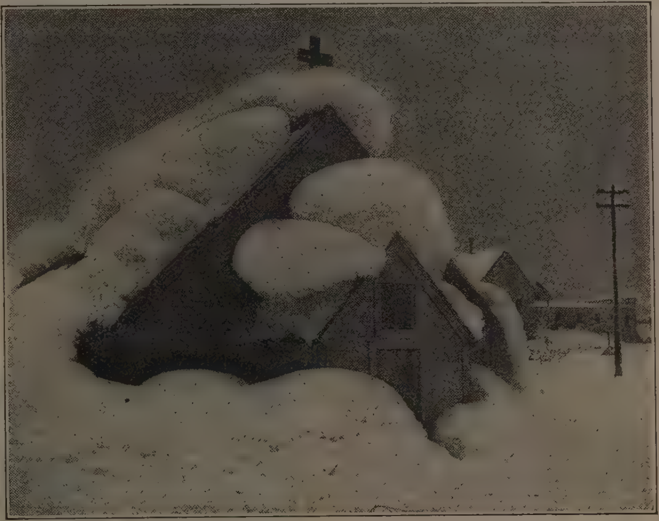

FIG. 150. — Scene after a winter snowstorm on the Alaskan coast.

Still more important, at present, is salmon fishing. Here, as in the Columbia River (p. 116), the salmon run up the streams every summer. Sometimes the streams are almost full of these fish, all struggling to get up to the place where the eggs are laid. It is a wonderful sight to see such a salmon "run," as it is called. Immense quantities of Alaskan salmon are canned at canneries scattered along the coast. The Alaskan steamers are loaded with canned salmon every fall, taking them to Seattle or other ports, for shipment to all parts of the world.

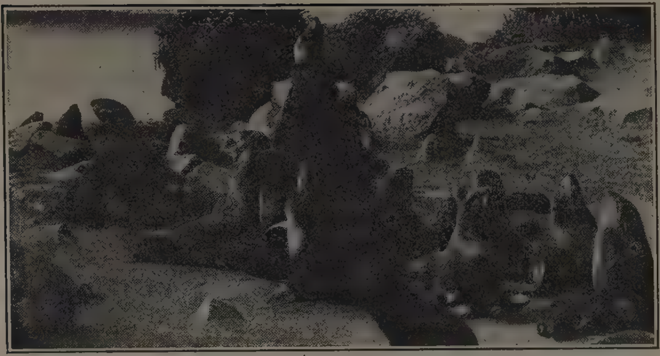

Fig. 151. — A group of fur seals on the shore of the Pribilof Islands.

(2) *Sealing*

Many different kinds of seals are found along the Alaskan coast. One of these, the *fur seal,* which lives in Bering Sea, is of great value because of its soft fur, which is much used for winter coats. During the greater part of the year the fur seals swim about in search of food; but in the spring, during the breeding season, they resort to the Pribilof Islands (Fig. 151).

The United States government prohibits all persons from killing the fur seal, except one company, which pays a special tax for the privilege of securing a certain number each year. At the proper season the men select a number of seals and drive them off for slaughter, much as sheep would be driven. There are so few of these seals, and they are so easily killed, that if the government did not protect them, all would soon be destroyed.

At present the fisheries are by far the most important of Alaskan industries. Thus far their products have amounted in value to over $150,000,000, nearly one half of which has been received for the salmon.

2. Mining

Valuable as the fisheries are, it is the minerals, especially gold, that have attracted most attention to Alaska. In 1896 rich gold deposits were discovered in the gravels of a small stream, the *Klondike,* a tributary to the Yukon River in Canada, just across the Alaskan boundary. In a single year fifty thousand men rushed to this new gold field (Fig. 152), as people did to California in 1849.

Since then gold has been found in many parts of Alaska, as at Nome, in the Tanana Valley, and elsewhere; and every year thousands of men go there. But most of them return in the fall, partly to escape the cold winter, and partly because the gravels can-

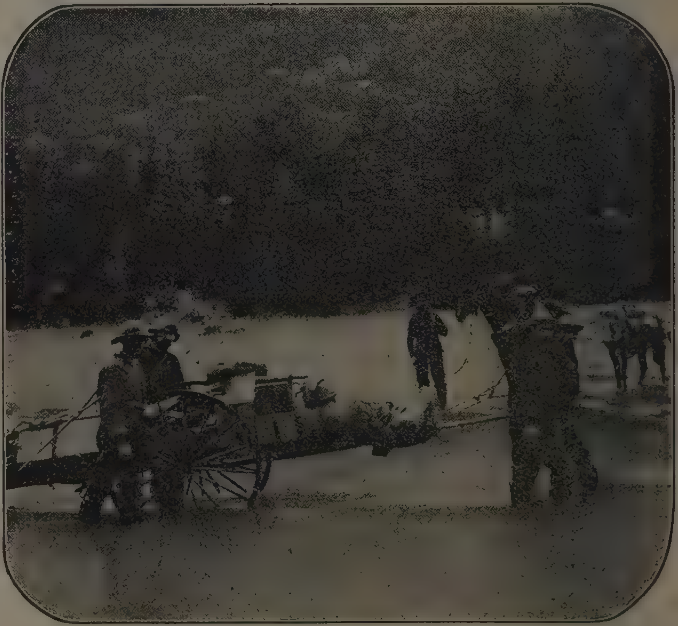

Fig. 152. — Miners fording the icy waters of an Alaskan river on the way to Klondike. Two of them are harnessed in a wagon containing their supplies.

not be washed when the ground is frozen. In some places, where the ground is frozen even in summer, it has been necessary to thaw it out by means of fires before the gravel could be washed. In 1910, Alaska ranked fourth in the production of gold in the Union, the value of the output being over $16,000,000.

One great difficulty has been to reach the gold fields and to carry supplies to them. The early miners were exposed to great hardships on their journey to the Klondike region. Now, however, by the help of a short railway across the mountains, one can go into the interior of Alaska much more easily. In summer many go up the Yukon River in boats; but this is impossible in winter when the river is frozen. Trace this course. How does the Yukon River compare in size with the Ohio (Appendix, p. 397)?

Partly because of the difficulty of taking in supplies and machinery, there has, as yet, been little gold mining in the solid rock. There are, however, some such mines already opened, the largest being on Douglas Island near JUNEAU, where there is the largest stamp mill in the world. Nor has there been much mining of other minerals, although enormous deposits of copper and coal are known to exist in Alaska.

Prospects for the future

1. In connection with fishing and mining

No doubt the salmon industry will increase in importance in the future. This is true also of the mining. When, as at present, supplies have to be drawn in by dogs, or on the backs of men or of horses, even across glaciers and lofty mountains, the expense of transportation is very great. However, railroads are now being built to the richest gold and copper regions; and when these are finished, the amount of metal mined will be greatly increased.

2. In connection with other resources

There are other valuable resources in Alaska. Among them are the extensive forests, especially along the southeastern coast, and in some of the warmer valleys of the interior.

Although the country is very mountainous, there is much good soil; and in some places the climate is suitable to farming. Besides, even where the summers are too short for crops, grass often grows luxuriantly. It is possible, therefore, to raise sheep and cattle here, and no doubt this will some day be one of the industries of Alaska.

Reindeer also thrive in this country. On the tundras in northern Asia the reindeer is a domestic animal, supplying the people with meat, milk, and hides, besides serving as a draft animal. The reindeer has already been introduced into the tundras of Alaska, and will make it possible for people to live there much more comfortably.

There is no doubt, therefore, that Alaska will prove much more valuable to us in the future than it has thus far been.

Principal towns

In such a new country there are, of course, no large cities. The oldest and best known is the quaint town of SITKA, the former capital. JUNEAU, which was made the capital a few years ago, besides being near valuable gold mines, is on the route to the Klondike. It is, therefore, an important center. Not far north is SKAGWAY, where miners leave the steamer to take the *White Pass* Railway to the headwaters of the Yukon.

There are also many mining towns, such as DAWSON, in the Klondike region of Canada, and NOME, on Bering Sea. In 1898, the beach sands at Nome were found to contain gold, and in a single season a good-sized city had grown on the beach. Large numbers of men lived in tents, and others in rough wooden shanties. In 1900, there were over twelve thousand people here; but ten years later, there were only about one sixth as many. In such a mining district a town may grow up in a year and become deserted in a single season.

2. Porto Rico and Cuba

Their history

We have just seen that the United States has secured possession of distant Northern lands; it has still more recently come into control of some tropical islands. As a result of our war with Spain, in 1898, Porto Rico was ceded to the United States and Cuba was given its independence, under the general guidance of the United States.

Since that time, Porto Rico has made great advance; but Cuba has not done so well. After the war, our government occupied Cuba for a while, then handed over the control to the Cuban people, who established a republican form of government. But soon trouble arose, and in 1906 the United States had to interfere again. In 1909 the Cubans were again given control. Cuba is not a dependency of our country, as Porto Rico is, but the United States has a right to interfere there when it seems necessary in order to preserve peace. Since it is thus under our protection, we are more interested in Cuba than in other islands of the West Indies, with the exception of Porto Rico; and it seems better to describe Porto Rico and Cuba together than to class Cuba with the other West Indian Islands in which we have no special interest.

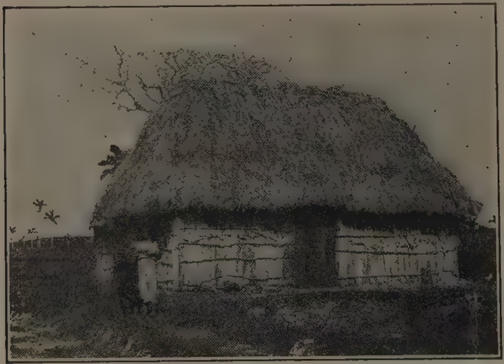

Fig. 153. — A native hut in Cuba.

Area and surface features

Cuba is the largest island in the West Indies, being nearly as large as Pennsylvania, although much longer and narrower. Porto Rico is somewhat smaller than Connecticut. Each of these islands is quite mountainous, the peaks in Cuba ranging from 2000 to 4000 feet above sea level, while one of them reaches an altitude of 8600 feet.

Climate

Both islands lie entirely within the tropical zone, and on the lowlands neither snow nor frost are known. On account of the warm climate many people from the United States go to Porto Rico and Cuba to spend the winter. There is an abundance of rain in most parts of the islands; but the rainfall is especially heavy on the northeastern, or *windward*, slopes, where the damp winds, which blow from the northeast, first reach the land. The summer is the rainiest season, for then the winds blow with greatest strength and steadiness.

Agriculture

While there are mountain ranges in each of the islands, a large portion of Porto Rico and Cuba has been cleared and cultivated. This is especially true of Porto Rico, which is really an island of farms. Crops grow luxuriantly partly because of the excellent soil, and partly because of the favorable climate. Indeed, agriculture is the chief industry on both islands.

1. The farm products

As in all the West Indies, the principal crop is sugar cane (Fig. 155), and the industry is carried on much as it is in Louisiana (p. 58). A second important crop is tobacco, for which Cuba is especially noted. Tobacco is also raised extensively in Porto Rico. At HAVANA, and other places, it is manufactured into cigars, which bring high prices, — the Havana cigar being considered the best that is made.

Upon the hill slopes much coffee is produced, and some tea and cocoa. Spices, including nutmeg, cinnamon, and ginger,

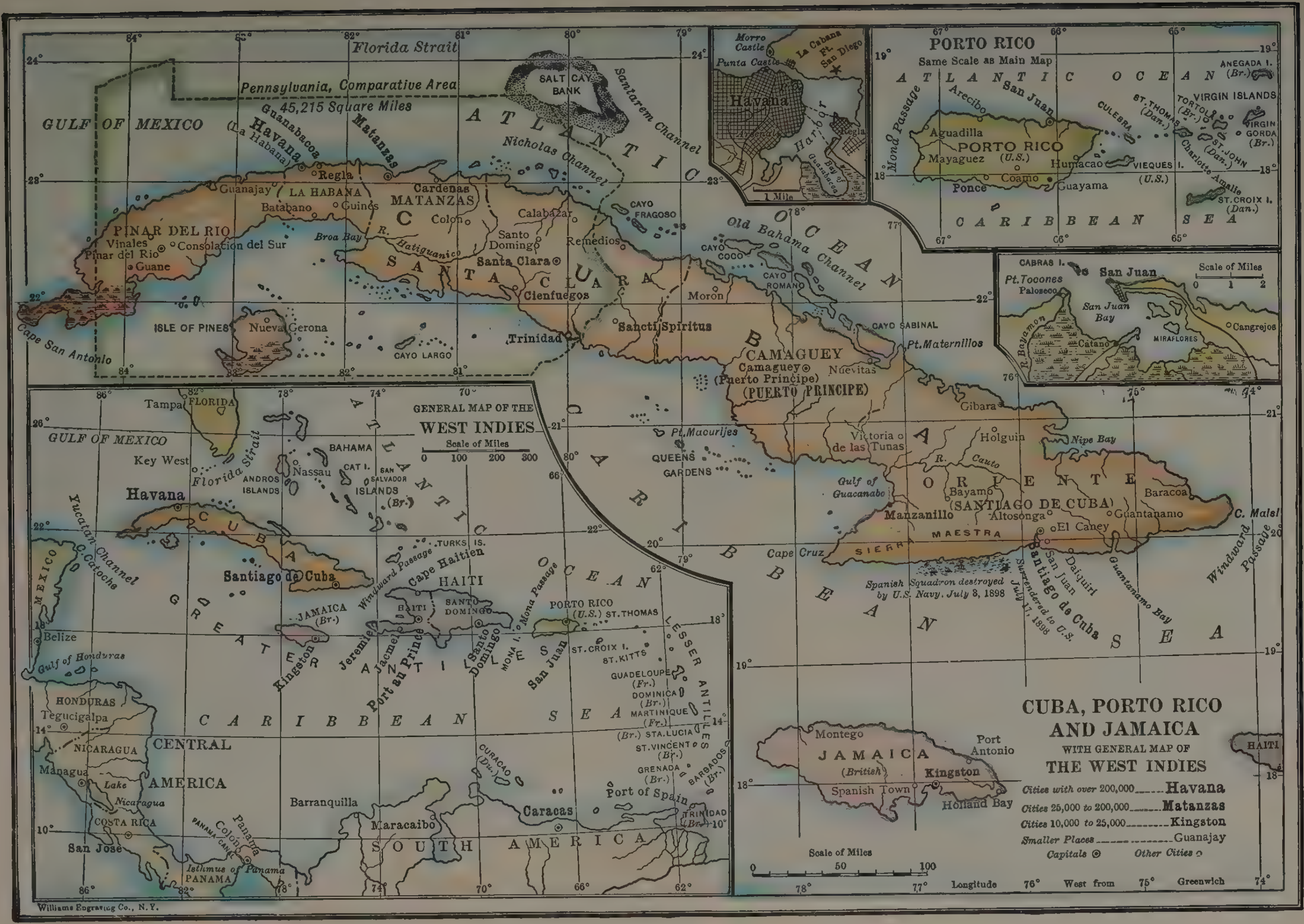
CUBA, PORTO RICO AND JAMAICA
WITH GENERAL MAP OF THE WEST INDIES
Cities with over 200,000 Havana
Cities 25,000 to 200,000 Matanzas
Cities 10,000 to 25,000 Kingston
Smaller Places Guanajay
Capitals
Other Cities
Longitude 76° West from 75° Greenwich
Scale of Miles
0
50
100
Florida Strait
GULF OF MEXICO
Pennsylvania, Comparative Area 45,215 Square Miles
SALT CAY BANK
Santarem Channel
Nicholas Channel
Old Bahama Channel
ATLANTIC OCEAN
CARIBBEAN SEA
Havana (La Habana)
Guanabacoa
Regla
Matanzas
Guanajay
LA HABANA
Batabano
Guines
Cardenas
MATANZAS
Colon
Calabazar
Santo Domingo
Remedios
Santa Clara
SANTA CLARA
Cienfuegos
Trinidad
Sancti Spiritus
Moron
PINAR DEL RIO
Vinales
Pinar del Rio
Consolacion del Sur
Guane
Broa Bay
R. Hatiguanico
ISLE OF PINES
Nueva Gerona
CAYO LARGO
Cape San Antonio
CAYO FRAGOSO
CAYO COCO
CAYO ROMANO
CAYO SABINAL
Pt. Maternillos
CAMAGUEY
Camaguey (Puerto Principe)
(PUERTO PRINCIPE)
Nuevitas
Pt. Macurijes
QUEENS GARDENS
Gibara
Victoria de las Tunas
Holguin
Nipe Bay
R. Cauto
ORIENTE
(SANTIAGO DE CUBA)
Bayamo
Manzanillo
Gulf of Guacanabo
Altosonga
El Caney
Baracoa
Guantanamo
C. Maisi
Windward Passage
Cape Cruz
SIERRA MAESTRA
Spanish Squadron destroyed by U.S. Navy, July 3, 1898
Santiago de Cuba
Surrendered to U.S. July 17, 1898
San Juan
Daiquiri
Guantanamo Bay
Morro Castle
Punta Castle
La Cabana
Ft. San Diego
Havana
Arsenal
Harbor
Regla
Bay of Guanabacoa
1 Mile
PORTO RICO
Same Scale as Main Map
Mona Passage
Arecibo
San Juan
Aguadilla
PORTO RICO (U.S.)
Mayaguez
Humacao
Coamo
Ponce
Guayama
CULEBRA
VIEQUES I. (U.S.)
ST. THOMAS (Dan.)
TORTOLA (Br.)
ST. JOHN (Dan.)
Charlotte Amalie
ST. CROIX I. (Dan.)
VIRGIN ISLANDS
ANEGADA I. (Br.)
VIRGIN GORDA (Br.)
CABRAS I.
Pt. Tocones
Paloseco
San Juan
San Juan Bay
R. Bayamon
Catano
MIRAFLORES
Cangrejos
Scale of Miles
0
1
2
JAMAICA (British)
Montego
Port Antonio
Kingston
Spanish Town
Holland Bay
HAITI
GENERAL MAP OF THE WEST INDIES
Scale of Miles
0
100
200
300
Tampa
FLORIDA
Key West
Florida Strait
BAHAMA
ANDROS ISLANDS
Nassau
CAT I.
SAN SALVADOR
ISLANDS (Br.)
TURKS IS.
Havana
CUBA
Santiago de Cuba
Yucatan Channel
C. Catoche
MEXICO
Belize
Gulf of Honduras
JAMAICA (Br.)
Kingston
Windward Passage
Cape Haitien
HAITI
SANTO DOMINGO
Jeremie
Jacmel
Port au Prince
Santo Domingo
MONA I.
Mona Passage
PORTO RICO (U.S.)
San Juan
ST. THOMAS
ST. CROIX I.
ST. KITTS
GREATER ANTILLES
LESSER ANTILLES
GUADELOUPE (Fr.)
DOMINICA (Br.)
MARTINIQUE (Fr.)
(Br.) STA. LUCIA
ST. VINCENT (Br.)
GRENADA (Br.)
BARBADOS (Br.)
TRINIDAD (Br.)
Port of Spain
CURACAO (Du.)
Caracas
Barranquilla
Maracaibo
SOUTH AMERICA
CENTRAL AMERICA
HONDURAS
Tegucigalpa
NICARAGUA
Managua
Lake Nicaragua
COSTA RICA
San Jose
Colon
Panama
PANAMA CANAL
Isthmus of Panama
PANAMA
Williams Engraving Co., N. Y.

FIG. 154.

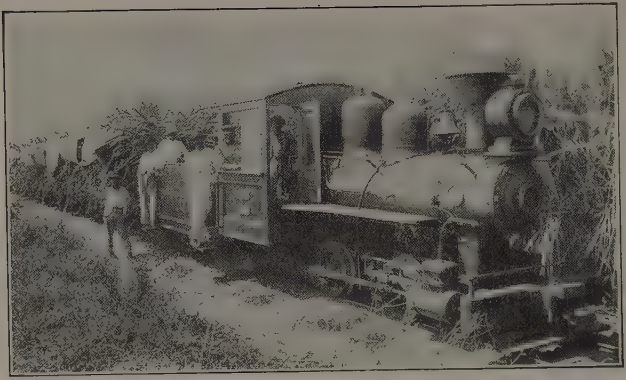

FIG. 155. — A train on a sugar plantation in Porto Rico drawing the sugar cane to the sugar mill.

are products of the West Indies; also pepper, cardamom, vanilla, and pimento or allspice. Such fruits as bananas, oranges, limes, pineapples (Fig. 156), and cocoanuts are grown in great quantities; and there are also many vegetables. There is much pasture, too, and many cattle are raised.

2. Their special value to the United States

Our soil and climate have enabled us to raise almost all the farm products that we have needed, except such as may be produced within these islands. They can send us tea, coffee, sugar, spices, and tropical fruits. They can also send us fruits and vegetables in midwinter. Thus it is of great value to us that we have such close relations with these islands.

Conveniences for transportation

Railways connect some of the cities, and also reach out into the agricultural districts, thus serving to bring the crops to the chief ports for shipment. However, many of the towns are not connected by rail; and since there are few good wagon roads, they have almost no communication with the outside world, except by boat.

During its occupation of Cuba, the United States has had one good macadam road built from the eastern to the western end of the island. Steamboat lines now run from American ports to Havana and other West Indian ports.

Principal cities

Owing partly to lack of coal, and partly to the bad government of the Spaniards, there has been very little manufacturing. There are, however, several important cities along the coast. The largest of these is HAVANA, in Cuba, for a long time the center of the Spanish rule in America. Another Cuban city is SANTIAGO, where the Spanish ships were sunk in the war of 1898; and a third is MATANZAS.

The two principal cities of Porto Rico are SAN JUAN, on the northern coast, and PONCE, on the southern. The former is the largest city and capital of the island.

Inhabitants of the islands

Portions of Porto Rico and Cuba are densely populated, although in Cuba's wars with Spain thousands upon thousands were killed in battle or starved to death. Much property was destroyed, and altogether the island was so badly governed that it will be many years before a full tide of prosperity returns.

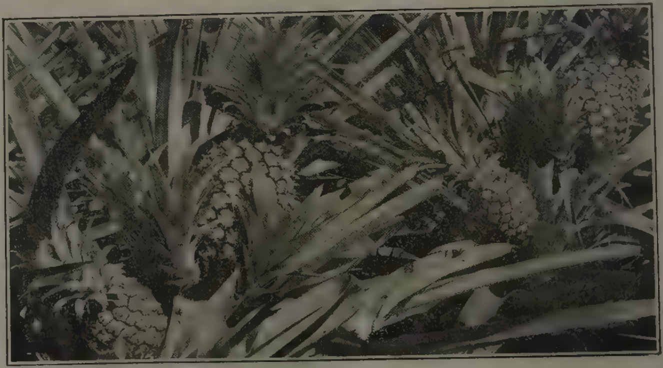

FIG. 156. — Pineapples growing in Porto Rico.

Many of the natives are of mixed blood. The Indians did not prove good slaves to their Spanish conquerors, and negro slaves were brought from Africa. Therefore, while pure-blooded Spaniards are numerous, many of the inhabitants of Porto Rico and Cuba are negroes, either full blooded or half-breeds. Under Spanish rule these natives were very poor and densely ignorant; but they are capable of advance under proper guidance.

3. Panama Canal Zone (Fig. 157)

Its location and extent

One of the most interesting regions controlled by the United States is the Panama Canal Zone, a strip of land and water about fifty miles long and ten miles wide. This zone extends from the Caribbean Sea across the isthmus into the Pacific Ocean. It includes some other land in the vicinity of the canal and the islands in the Bay of Panama. According to a treaty between the United States and the Republic of Panama, the government of this zone is placed under the control of the United States for an unlimited time.

Its cities and ports

At the entrance to the Canal, on the Caribbean Sea, is located the city of COLON, formerly called Aspinwall. It is a city with large shipping docks and well-paved streets. The shipping business is very important. French, German, English, and American passenger boats call here regularly, and freight vessels from many nations are daily seen at CRISTOBAL, the port just at the entrance to the Canal.

PANAMA, across the isthmus, at the south end of the Canal Zone, but only two hours away, is a splendid city of old fortifications, monuments, and churches. It is the central market for most of the native products and the distributing point for the entire isthmus. Near the city, at the entrance to the Canal, is PORT ANCON, where the large ocean-going vessels and other ships engaged in foreign commerce are accustomed to call as they enter the Canal.

The cities of Panama and Colon are under the government of Panama, but the United States government has the right in both cities, as well as in the Canal Zone, to make provision for the health of the inhabitants.

These two cities are also connected by the Panama Railroad, a work which was begun about 1850, and, after much hardship, completed nearly five years later. When the canal was built, it was necessary to remove this railroad and rebuild it.

The Canal itself is a magnificent public work. Its channel is broad and deep, and from 300 to 500 feet wide at the bottom. It has huge locks 110 feet wide and 1000 feet long, arranged in pairs so as to provide for vessels going in either direction. The Canal also passes through two large artificial lakes, one of them over 30 miles long, made by a dam across the Chagres River; and through a tremendous cut in the hills at Culebra.

4. The Hawaiian Islands (Fig. 161)

Their location and mountainous character

Far out in the mid-Pacific, not quite a third of the distance from our western coast to the Philippine Islands, is a mountain chain fifteen hundred miles long, most of which lies beneath the ocean. Several large volcanic peaks rise above the water, forming a chain of islands, known as the Sandwich, or Hawaiian, Islands. The largest of these islands is Hawaii, which is nearly as large as Connecticut. Each of the islands is made chiefly of melted rock, or lava, which has risen from within the earth. Two of the Hawaiian volcanoes are still active, and the fiery hot lava flows out from them every few years. The larger, Mauna Loa, rises nearly fourteen thousand feet above the sea.

The latitude of the Hawaiian Islands is about the same as that of Cuba and

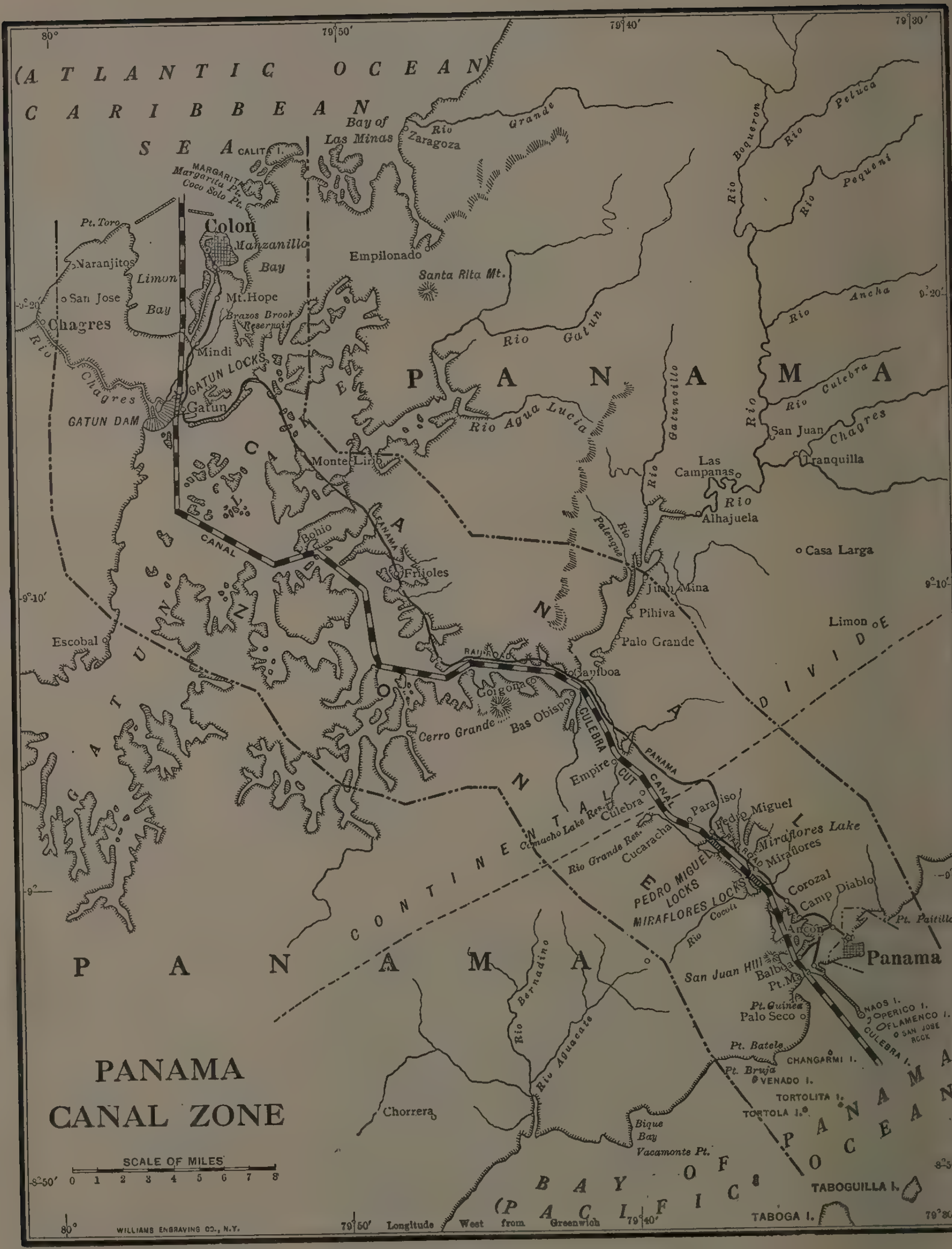
PANAMA CANAL ZONE
(ATLANTIC OCEAN)
CARIBBEAN SEA
CALITA I.
Bay of Las Minas
Rio Zaragoza
Rio Grande
MARGARITA I.
Margarita Pt.
Coco Solo Pt.
Pt. Toro
Colon
Manzanillo Bay
Naranjitos
Limon Bay
San Jose
Chagres
Rio Chagres
Mt. Hope
Brazos Brook Reservoir
Mindi
Empilonado
Santa Rita Mt.
Rio Boqueron
Rio Peluca
Rio Pequeni
Rio Ancha
Rio Gatun
GATUN LOCKS
Gatun
GATUN DAM
PANAMA
Rio Agua Lucia
Rio Gatuncillo
Rio Culebra
San Juan
Rio Chagres
Tranquilla
Monte Lirio
Las Campanas
Rio Alhajuela
CANAL ZONE
CANAL
PANAMA R.R.
Bohio
Frijoles
Rio Palenque
Casa Larga
Juan Mina
Pihiva
Palo Grande
Limon
Escobal
GATUN LAKE
RAILROAD
Gamboa
Gorgona
Bas Obispo
Cerro Grande
CULEBRA CUT
PANAMA CANAL
Empire
Culebra
Camacho Lake Res.
Rio Grande Res.
Cucaracha
Paraiso
Pedro Miguel
Miraflores Lake
Miraflores
PEDRO MIGUEL LOCKS
MIRAFLORES LOCKS
Rio Cocoli
Corozal
Camp Diablo
Pt. Paitillo
Ancon
Panama
CONTINENTAL DIVIDE
San Juan Hill
Balboa
Pt. Mala
Pt. Guinea
Palo Seco
NAOS I.
PERICO I.
FLAMENCO I.
SAN JOSE ROCK
CULEBRA I.
Rio Bernardino
Rio Aguacate
Pt. Batele
CHANGARMI I.
Pt. Bruja
VENADO I.
TORTOLITA I.
TORTOLA I.
Chorrera
Bique Bay
Vacamonte Pt.
BAY OF PANAMA
(PACIFIC OCEAN)
TABOGUILLA I.
TABOGA I.
SCALE OF MILES
0 1 2 3 4 5 6 7 8
80°
79°50′
79°40′
79°30′
9°20′
9°10′
9°
8°50′
Longitude West from Greenwich
WILLIAMS ENGRAVING CO., N.Y.

FIG. 157.

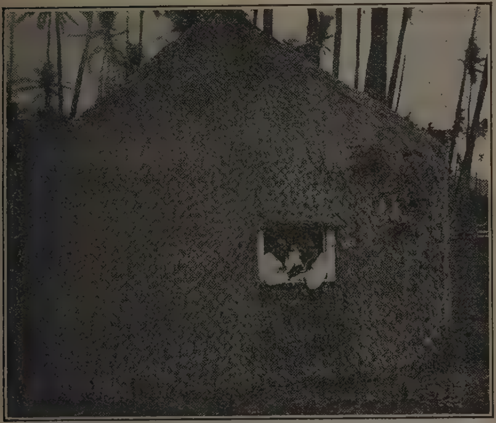

FIG. 158. — The grass hut of a native in the Hawaiian Islands.

Their climate

Porto Rico. Being in the midst of the broad Pacific, and therefore surrounded by warm ocean water, the climate is warm and equable. From day to night, and even from summer to winter, the thermometer varies only a few degrees. As in the West Indies, the northeast winds blow steadily and bring an abundance of rain to the windward slopes. The southwestern, or *leeward*, slopes are much drier, and in some places even arid.

People, industries, and chief cities

The Hawaiian natives, who are Malayans, are an intelligent race, resembling those of other Pacific islands. The Chinese form a large part of the foreign population; but there are also many Japanese, Portuguese, and Americans.

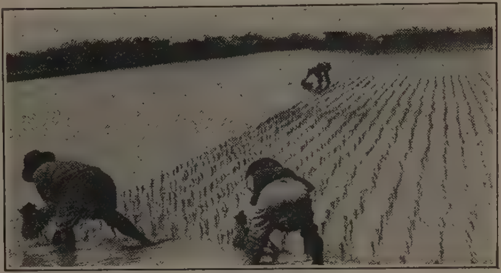

FIG. 159. — Natives planting rice in a flooded field in the Hawaiian Islands.

In 1893, the ruler, a native queen, was deposed, and the white population set up an independent government and offered the islands to the United States, as a territory. After some delay the offer was accepted, and the islands have been under our control since 1898.

Many years ago white men introduced

FIG. 160. — Natives cutting sugar cane on a plantation in the Hawaiian Islands.

the crops of the Old World, and the larger islands have become quite productive, the principal crop being sugar (Fig. 160). Coffee, tropical fruits, and rice (Fig. 159) are other products, the last being cultivated especially by the Chinese.

The two leading cities are HONOLULU, on the island of Oahu, and HILO, on Hawaii.

Value of the islands to the United States

The Hawaiian Islands were one of the principal sources of food for the early Californian miners; and great quantities of raw sugar are now brought from the islands to be refined on the Pacific coast. San Francisco has long been the chief market place for the products of these islands.

5. Other Small Island Possessions

Samoa

For a number of years the United States, Germany, and England had control over the Samoan Islands, far to the southwest of the Hawaiian Islands (Fig. 161). This arrangement did not prove satisfactory, and now *Tutuila*, one of the islands, is owned by the United States. It is of little value to us except for the coaling station at the harbor of *Pago Pago*. APIA, the chief city in the Samoan Islands, is on the island of Upola, which belongs to Germany.

Guam

As one of the results of the war with Spain, we obtained the island of *Guam* (Fig. 161), one of the Ladrones, or Robbers' Islands, some distance east of the Philippines. Like Tutuila, Guam is of little service to us except as a coaling station for vessels.

Other islands

Our country has obtained possession of several other small islands in the Pacific. Among these are *Marcus Island*, northeast of Guam; *Wake Island*, between Guam and the Hawaiian Islands; *Midway Islands*, northwest of the Hawaiian Islands; and two small islands, *Baker* and *Howland*, nearly on the equator south of the Midway Islands. None of these are of special importance.

6. The Philippine Islands (Fig. 161)

How acquired

During the Spanish War, Admiral Dewey destroyed the Spanish war ships in the harbor of Manila, and took possession of the Philippine Islands for the United States. At the close of the war we paid Spain $20,000,000 to give up all claim to them, and since then they have formed a part of our territory.

Surface features

This group of islands, or archipelago, consists of more than three thousand islands, many of which are very small. The largest, Luzon, is about the size of Kentucky; and the second, Mindanao, is almost as large.

While parts of the islands are mountainous, there are many valleys in which the soil is deep and fertile, being formed by the decay of lava, limestone, and other rocks rich in plant food.

Since none of the islands is very large, there can be no great rivers. Still, there are some with deep mouths, making good harbors; and steamboats are able to navigate the lower portions of all the larger rivers.

Climate

As in the West Indies, the climate of the Philippines is tropical — always warm, and sometimes very hot, especially at a distance from the sea.

The year is divided into the dry and rainy seasons, the former coming during the winter months, the latter in the summer. The dry period lasts as long as the winds blow from the northeast, and then the fields often become parched and cracked, and the roads very dusty. In the summer, however, the winds change to the southeast. They are then so damp that there is a deluge of rain which changes much of the country to a swamp, making travel almost impossible.

The climate, on the whole, is so damp that there can be no cellars under the houses, for

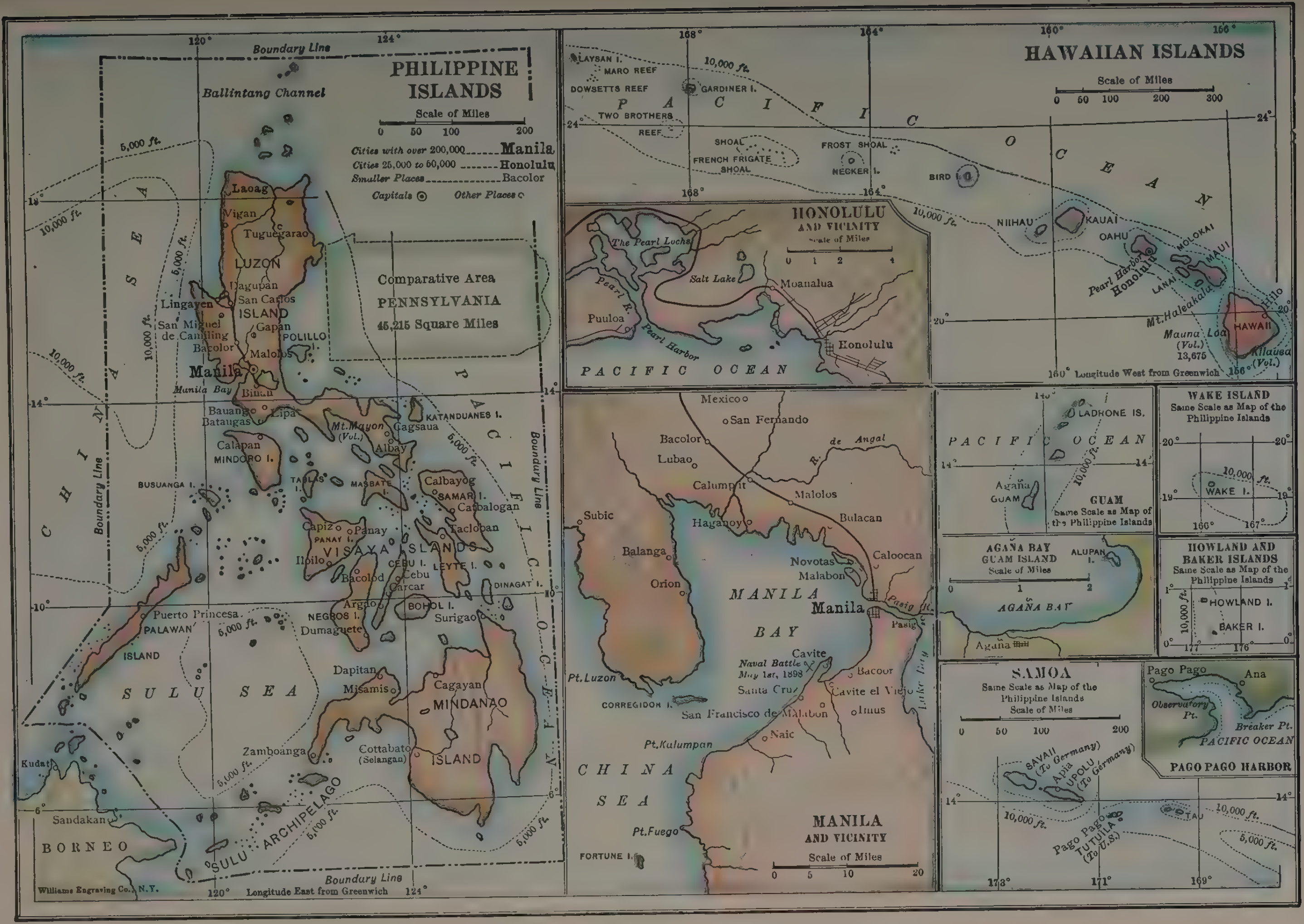

FIG. 161.
United States' Dependencies in the Pacific.

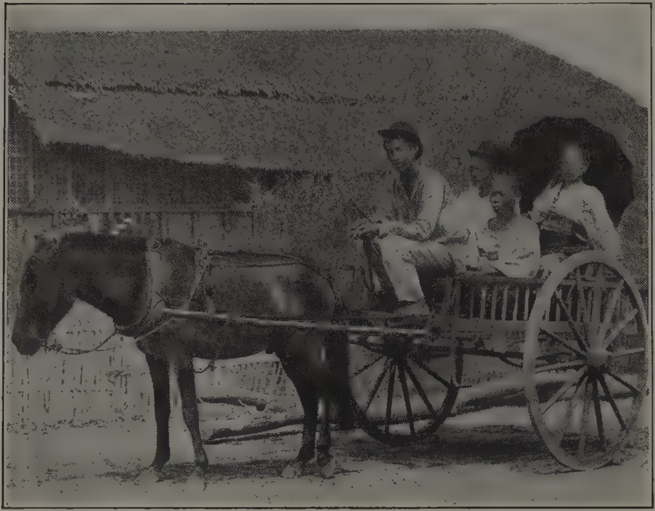

Fig. 162. — A family of Filipinos, or natives of the Philippine Islands belonging to the Malay race.

they would be too wet to be healthful (Fig. 163). Indeed, the houses themselves are usually raised above the ground, and the family lives in the second story. The lower part is often used for storage, as a cellar is in our country.

Vegetation and animal life

Forests cover a large part of the archipelago, for trees thrive here, often forming a tropical jungle. Among the valuable woods are ebony, the rubber tree, from which gutta percha is obtained, and a palm from whose sap alcohol may be made. Cinnamon, cloves, and pepper grow in these islands, and cocoanut and banana trees are also very common.

As in other tropical forests, there are immense numbers of animals, especially insects, serpents, and beautiful birds. Among the serpents are the huge python and the deadly *cobra de capello*. There are also deer, apes, wild hogs, wild buffaloes, huge bats, and man-eating crocodiles.

Inhabitants

The inhabitants of the Philippines number over eight millions, about six sevenths of whom are civilized. Two very different races occupy the islands, — (1) the aborigines, or original inhabitants; and (2) the *Malays* (Fig. 162). The former, a race of small, dark-skinned savages, are called *Negritos*, a Spanish word meaning little negroes. They have been forced to retreat to the forests by the more powerful and intelligent Malays. Besides the Negritos, the Malays, and the half-breeds, many Chinese traders and Spaniards live on the islands; and now there are also many Americans.

Under the rule of the Spaniards, the more

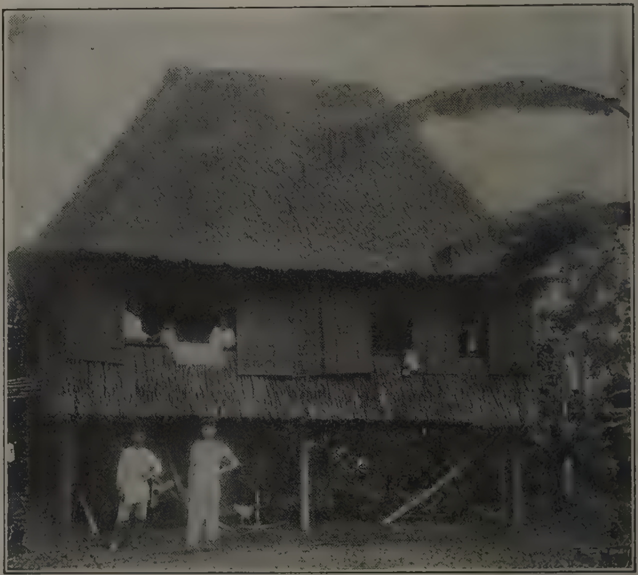

Fig. 163. — A native house in the Philippine Islands built of bamboo and covered with a thatch roof. Because of the dampness the houses do not rest on the ground.

Principal products

civilized tribes cleared the land and engaged in farming. Their wants are few, however, and very little work supplies them with what they need. Cocoanuts and bananas are easily obtained, and rice, yams, and other food plants may be easily raised. There is, therefore, no special reason for working hard; and, in fact, in that warm, humid climate hard work is almost impossible. For these reasons large numbers of the natives are unprogressive.

Many of the people, however, are industrious, and produce more than they need for themselves. Among the products for export are hemp, cocoa, coffee, sugar, and tobacco; the latter being manufactured into cigars at MANILA. This is almost the sole manufacturing of importance, and the inhabitants depend upon Europe and America for all but the very simplest articles.

Hemp is the best-known export of these islands. It is made from the fiber of the wild plantain, which so closely resembles the banana tree that most people could not tell the two apart. It is used for a number of purposes, one being for making rope. These islands supply the world with hemp for making the better grade, called Manila rope.

Cities

In the entire group of islands, there are many cities having a population of more than ten thousand; but there is only one of special importance. This is MANILA, on the island of Luzon. This city, which has over two hundred thousand inhabitants, is situated upon an excellent harbor, and was for a long time the center of the Spanish government in the Philippines. It is still the center of government in the archipelago.

Probable future progress

Under Spanish rule large portions of the islands were left in a wild state; and little attempt was made to use the resources to their fullest extent. The islands are able to produce far more farm products than at present. The riches of the forests have been little used; and the minerals, including gold, silver, coal, petroleum, marble, and sulphur, have likewise been largely neglected.

There is a promising future in the development of these resources, and the civilized natives are already helping greatly in the work. Many of them are educated and cultured, living in excellent homes. They are now partly governing themselves, having a legislature of their own; but the United States still holds control. We are helping to educate the people, and to establish a good government.

Review Questions and Suggestions

ALASKA: QUESTIONS. 1. How was Alaska obtained, and how was the purchase at first regarded? 2. Describe the climate. 3. What are the principal surface features? 4. What can you tell about the scenery? 5. What about the food fish there? 6. State the principal facts about the whaling. 7. The sealing. 8. The mining. 9. What about the future development of the territory? 10. Name and locate the leading towns.

SUGGESTIONS. 11. Collect some whalebone. 12. How does the area of Alaska compare with that of the United States proper? 13. Measure the length of the Yukon, and compare it with the Mackenzie. 14. Draw an outline map of Alaska.

PORTO RICO AND CUBA: QUESTIONS. 15. Give some facts in their history. What is our relation to Porto Rico? To Cuba? 16. What are their areas and principal surface features? 17. Describe the climate. 18. Name the farm products. 19. How are these products of special value to the United States? 20. What about the conveniences for transportation? 21. Name and locate the principal cities. 22. What about the inhabitants of the islands?

SUGGESTIONS. 23. Estimate the length and the average breadth of Cuba. 24. What products of Cuba and Porto Rico are also raised in the United States? Where? 25. State some advantage that Cuba enjoys over Louisiana in the production of sugar. 26. Make a sketch map of Cuba and Porto Rico.

PANAMA CANAL ZONE: QUESTIONS. 27. Locate this zone. 28. How was this strip of land obtained, and what is its extent? 29. What advantages have been secured by the canal?

Suggestions. 30. What difficulties were caused by the climate in the work of digging the canal? 31. Read magazine articles telling about the work.

The Hawaiian Islands and Other Small Islands: Questions. 32. Where are the Hawaiian Islands located? 33. What are their surface features? 34. Describe their climate. 35. State the principal facts about their inhabitants, industries, and principal cities. 36. What is the special value of these islands to the United States? 37. Name and locate other island possessions. 38. How are they important?

Suggestions. 39. Why should you expect much the same products in the Hawaiian Islands as in Cuba? 40. Why is not the summer very hot in these tropical regions? 41. What city on our eastern coast should be associated with San Francisco as important for refining sugar? 42. Explain the presence of many Chinese and Japanese in these islands.

The Philippine Islands: Questions. 43. How were these islands acquired? 44. Describe their surface features. 45. Their climate. 46. What vegetable and animal life is found here? 47. State the chief facts about the inhabitants. 48. What are the principal products? 49. What about the cities? 50. Explain the possibilities for progress in these islands.

Suggestions. 51. Compare the latitude of the islands with that of the West Indies and of the Hawaiian Islands. 52. Name several other places thus far studied that have volcanoes. 53. Collect pictures of scenes in the Philippines. 54. Obtain a piece of Manila hemp rope for the school collection; also a piece of bamboo and of rattan. 55. Find out about Dewey's capture of Manila. 56. Make a sketch map of the islands.

General Review Questions

57. Name the principal dependencies of the United States. 58. Locate each on the map of the world. 59. Walk toward each. 60. Name the principal products of each. 61. In what zones does each lie? 62. How did we obtain each? 63. Name and locate the principal cities in our dependencies.

V. Countries North of the United States

1. Canada and Newfoundland

Map study

1. Trace the boundary line between United States and Canada. 2. Which of our states border on Canada? 3. What has caused so many lakes in the Dominion? 4. Name and locate the eight largest (including the Great Lakes). 5. Name and locate the four largest rivers. Into what ocean does each drain? 6. Where are the largest cities? 7. What are the names of the largest? 8. What reasons can you see for their location? 9. Trace the Arctic Circle across Canada. 10. Compare the latitude of Labrador with that of England. 11. Locate the Gulf of St. Lawrence; Hudson Bay; Greenland; Newfoundland; Nova Scotia. 12. Name the divisions of Canada.

With the exception of Alaska almost all of the land north of our country belongs to Canada.

History

1. Contest between English and French, and the result

While the British were founding the thirteen colonies, the French occupied the coast of eastern Canada and made settlements at Quebec, Montreal, and other points along the St. Lawrence Valley. Even now a very large majority of the inhabitants of the Province of Quebec speak French as their mother tongue. The French and English were often at war; but finally England, aided by her colonies, won control of the French possessions north of the United States. Only the small islands of *Miquelon* and *St. Pierre* were retained by France, and they are still used by the French as fishing stations.

2. Name of the Union, and the provinces that make it

After our Revolutionary War, Canada still remained in possession of Great Britain. At first there were several colonies with separate governments, though all were under the control of Great Britain; but in 1867 a union was formed called the Dominion of Canada. There are nine divisions, or *provinces*, in the Dominion, — Nova Scotia, Prince Edward Island, New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, Alberta, and British Columbia. Each has a government of its own, as our states have; but the united provinces have a central government with the capital at Ottawa, which corresponds to our capital at Washington.

Besides these provinces, there are the

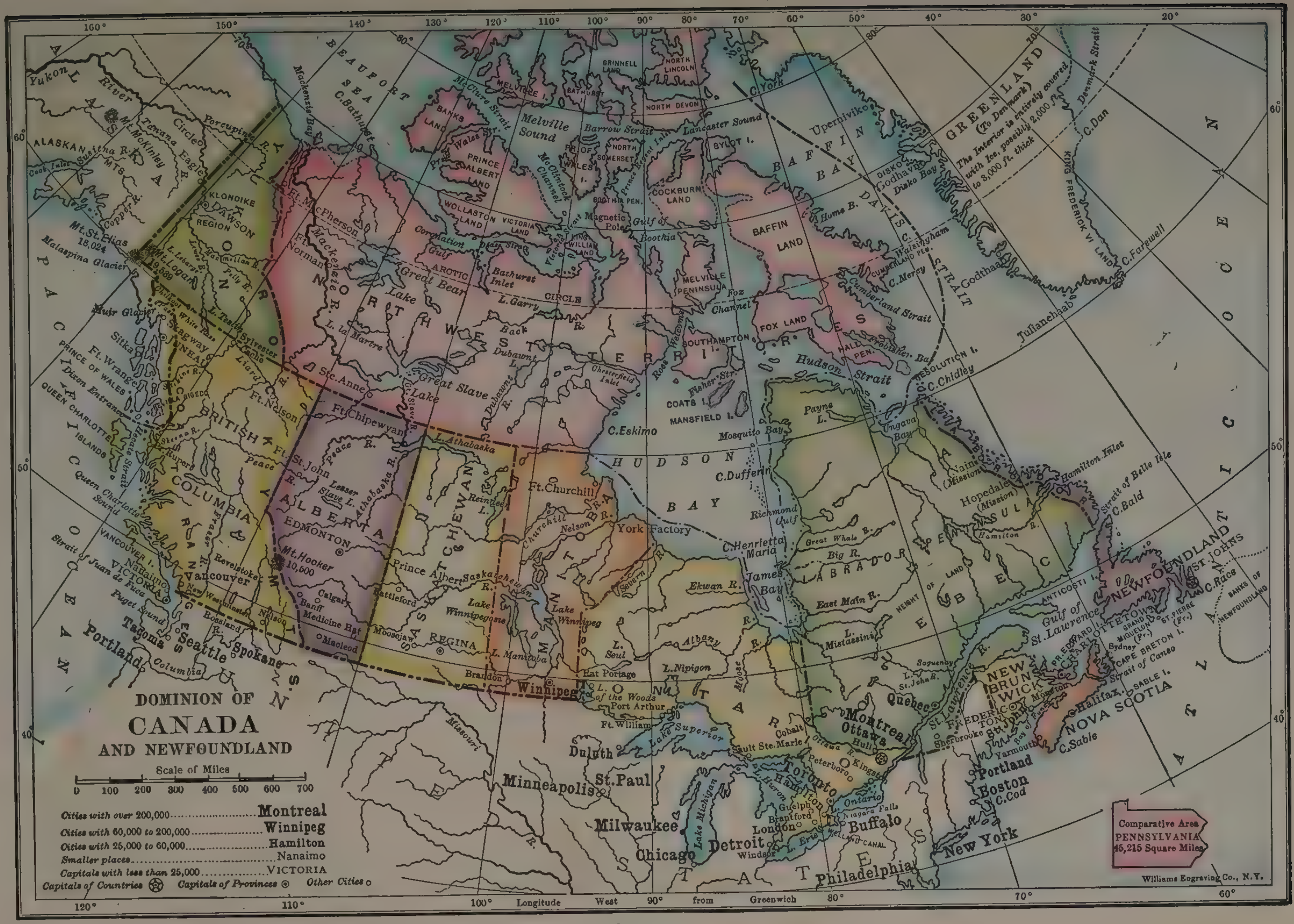
DOMINION OF
CANADA
AND NEWFOUNDLAND
Scale of Miles
0 100 200 300 400 500 600 700
Cities with over 200,000 Montreal
Cities with 60,000 to 200,000 Winnipeg
Cities with 25,000 to 60,000 Hamilton
Smaller places Nanaimo
Capitals with less than 25,000 VICTORIA
Capitals of Countries
Capitals of Provinces
Other Cities
Comparative Area PENNSYLVANIA 45,215 Square Miles
Williams Engraving Co., N.Y.
Longitude West from Greenwich
GREENLAND (To Denmark) The Interior is entirely covered with Ice, possibly 2,000 ft. to 8,000 ft. thick
BAFFIN BAY
DAVIS STRAIT
BAFFIN LAND
HUDSON BAY
NORTH WEST TERRITORIES
ARCTIC CIRCLE
YUKON
ALASKA
BRITISH COLUMBIA
ALBERTA
SASKATCHEWAN
MANITOBA
ONTARIO
QUEBEC
LABRADOR PENINSULA
NEWFOUNDLAND
NOVA SCOTIA
NEW BRUNSWICK
BEAUFORT SEA
PACIFIC OCEAN
ATLANTIC OCEAN
UNITED STATES
Montreal
Ottawa
Quebec
Toronto
Winnipeg
EDMONTON
REGINA
VICTORIA
Vancouver
Mt.St.Elias 18,024
Mt.Logan 19,539
Mt.Hooker 10,500

FIG. 164.

Yukon Territory, and several undeveloped territories. The names of the latter are given on the map (Fig. 164), but they have few inhabitants and are of little importance at present. Name these divisions.

3. Newfoundland

NEWFOUNDLAND has refused to join the Dominion, so that, while still a colony of Great Britain, it is not a part of Canada. Newfoundland includes not only the island by that name, but also the east coast of Labrador.

FIG. 165. — Lake Louise, nestled among the snow-capped mountains of western Canada, along the line of the Canadian Pacific Railway.

Surface features

1. Resemblance between southern Canada and northern United States

The surface of southern Canada very closely resembles that of our Northern States. Eastern Canada, for instance, is much like New England. That section of Canada which lies north of Ohio and New York is more level, like those states; and it is the most important farming region in the Dominion. Farther west, north of Dakota and Montana, are broad plains, increasing in elevation to the very base of the Rocky Mountains.

Climate

The climate of southern Canada, like the surface features, corresponds to that of our Northern States, though it is slightly cooler. The climate of Nova Scotia, New Brunswick, and southern Quebec, for example, resembles that of New England, while Ontario has a climate similar to that of New York, Ohio, and Michigan. Farther west, in Manitoba, we find nearly the same climate as in Minnesota and North Dakota; and west of this, in Saskatchewan and Alberta, come the arid lands. In British Columbia, on the west coast, there is heavy rainfall and an even temperature, as in Washington.

Toward the north, however, the country grows rapidly colder, until, in the extreme northern portion, the climate is frigid, and there are broad expanses of frozen tundra.

The Labrador current, which cools the temperature of New England so much (p. 27), sweeps from the Arctic Ocean past Labrador and greatly chills the coast of that region, as well as Newfoundland and Nova Scotia. There is no such ice-laden current in the Pacific, and for that reason the climate is far warmer there. Notice, for instance, how much farther north Vancouver and Juneau are than any city in eastern Canada.

Lumbering

1. Extent of the forests

The forests which cover northern New England extend into the hilly and mountainous section of New Brunswick and southern Quebec (Fig. 166). In fact, from there westward to the Pacific this wooded tract, sweeping northward around the vast plains of Manitoba, is from two to three hundred miles wide. This forest, which is one of the largest in the world, includes fully a million square miles, or over a fourth of the entire area of Canada.

2. Method of lumbering, and lumber centers

Lumbering is carried on in much the same manner as in the northern part of the United States (pp. 30 and 115). In the east one of the rivers down which the logs are floated to the sea is the St. John. Upon this river are FREDERICTON, the capital of New Brunswick, and ST. JOHN, the largest city in that province. In these two cities the logs are made into wood pulp and lumber. Immense quantities of both these products are shipped from the seaport of ST. JOHN.

The woods of Canada are at present one of its greatest sources of wealth; indeed, there are hundreds of sawmills at the rapids on the streams, and even in the large cities. Among the latter, MONTREAL, TORONTO, and OTTAWA are important, especially in the manufacture of lumber into such articles as doors, blinds, barrels, and furniture.

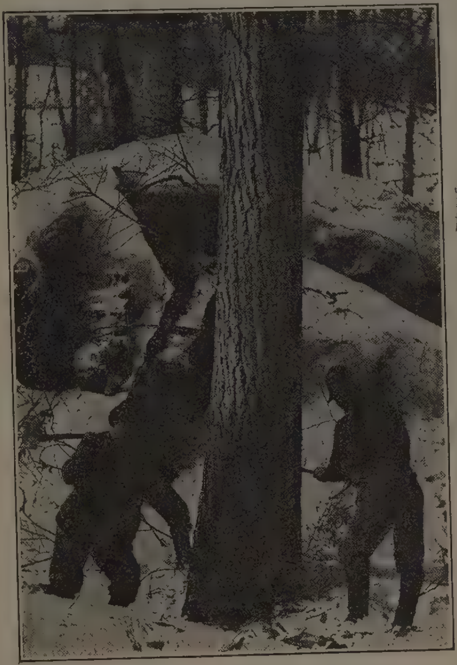

FIG. 166.—Lumbermen chopping down a tree in the forest of eastern Canada.

Fishing

1. Catching of food fish

It was the excellent fishing on the shallow banks off the eastern coast of Canada that early attracted the French to America, and fishing is still a flourishing industry along that coast. Fully fifty thousand people in Newfoundland and the eastern provinces, especially Nova Scotia and Prince Edward Island, are engaged in codfishing. One of the best-known fishing ports is YARMOUTH, in Nova Scotia, although a great deal of fishing is carried on from HALIFAX, and other smaller places in Nova Scotia. ST. JOHN'S, Newfoundland, is another important fishing port.

There is also much inland fishing, for the streams and lakes still abound in trout, pickerel, whitefish, bass, and salmon (Fig. 168). Every year large numbers of men go from Canada and the United States to enjoy the sport of fishing in the Canadian lakes and streams. In addition, there is much fishing on the west coast, especially for salmon.

Agriculture

1. Wheat and hardy fruits in the West

What was said about the agriculture and grazing in our Northern States applies almost equally to Canada. For example, the warm, damp ocean winds favor the production of wheat and the hardy fruits in British Columbia as well as in Washington (p. 116).

2. Ranching in the arid lands

Farther east, on the plains at the base of the Rocky Mountains, the climate is too arid for farming. Here, therefore, ranching is the principal industry, as in Montana and western Dakota (pp. 90 and 121). Immense herds of sheep and cattle are raised on these plains. There are several towns here, the largest being CALGARY.

3. The greatest grain region, and its leading city

In central Saskatchewan the climate begins to be more favorable for agriculture, and there, as well as in Manitoba, enormous quantities of wheat are raised. This wheat belt is a continuation of that found in Min-

FIG. 167. — One of the large trees in the forest of western Canada. The boy sitting on the trunk gives a scale by which you can judge the size of the tree. Contrast its size with that shown in Figure 166.

nesota and eastern Dakota. Although the winters are long and cold, the summers are warm, so that the hardy grains, especially wheat (Fig. 169), oats, and barley, thrive.

In the midst of this wheat region is WINNIPEG, in which flour is manufactured, as in Minneapolis. This city is situated on the banks of the Red River of the North, which empties into Lake Winnipeg. Find out, from the map (Fig. 164), what other large river is tributary to this lake, and what is the name of its outlet.

4. The most populous farming section, and its products

The country north of Lake Superior is hilly and for the most part forest-covered, being quite like northern Minnesota and Michigan. There is, therefore, little agriculture here.

Farther east, on the peninsula between Lakes Erie, Huron, and Ontario, is some of the best farm land in Canada. This region is in the province of Ontario, which is the most populous of the Canadian provinces, containing about one third of all the people in Canada. What large cities do you find here? More than two thirds of the inhabitants of Ontario, however, dwell either on farms or in small towns in the farming districts.

Ontario is no farther north than central and western New York; and its climate is greatly influenced by the Great Lakes. Here grapes, peaches, corn, and even tobacco are raised; and also quantities of oats, wheat, barley, and flax. Some of the finest horses in America are reared in Ontario, and the province is further noted as a dairy region.

5. Farming in southeastern Canada

There is a strip of excellent farming country almost the entire length of the St. Lawrence River, and along a part of the southern shores of the Gulf of St. Lawrence. Prince Edward Island has many fine farms, and

FIG. 168. — Photograph of a salmon leaping up over a waterfall in a stream on the coast of Labrador. This fall is over ten feet high and yet the salmon are able to leap up over it.

FIG. 169. — Fields of wheat, some cut, some uncut, on the level, fertile plains of southern Manitoba.

portions of Nova Scotia and New Brunswick also are farming districts. One of the best and most beautiful farming regions in all Canada is in southwestern Nova Scotia, noted especially for delicious apples. It was here that the French settlements were made about which Longfellow has written in his "Evangeline"; and this is often called "The Land of Evangeline."

Mining

1. In British Columbia and Yukon Territory

Western Canada, like western United States, is a noted mining region. Among the minerals, gold and silver are especially important, though lead and copper ores, building stone, coal, and other mineral products are also obtained. Valuable deposits of coal are found both among the mountains and in the plains farther east. You have already learned that the famous Klondike region is situated in Yukon Territory, near the Alaskan boundary. Although so near the Arctic Circle, DAWSON CITY, in the Klondike, has grown rapidly because of the gold mining.

2. In Ontario and southeastern Canada

Gold and silver are found in the province of Ontario, in the vicinity of the Lake of the Woods. One of the most remarkable silver deposits on the continent has recently been discovered at Cobalt, north of Toronto. Nickel is also mined in Ontario, and some oil fields have been developed.

Although iron ore has been discovered in certain places, the scarcity of coal, near at hand, has prevented Canada from producing much iron. The coal of western Canada is too distant for use in the Eastern cities, and the coal beds of the East have never been thoroughly developed. In Nova Scotia, and on Cape Breton Island, which is a part of Nova Scotia, there are extensive beds of soft coal, like that of western Pennsylvania and the Central States. This coal is shipped to the cities of the St. Lawrence Valley. A few years ago blast furnaces were erected at SYDNEY, Cape Breton Island, and an important iron-manufacturing industry has arisen there. This has increased the value of the Nova Scotia coal.

Transportation

There appear to be two outlets by water for central Canada, — one by way of the St. Lawrence, the other by way of Hudson Bay. The latter is of little use, however. Explain why.

Canada shares with the United States the advantages of navigation on all the Great

Lakes, with one exception. Which is it? Fortunately for Canada, the lower St. Lawrence lies wholly within that country. But this river has some serious drawbacks. One is the ice that stops navigation in winter. A second is the presence of numerous rapids over which vessels cannot pass in going upstream. In addition, dense fogs are common in the Gulf of St. Lawrence and along the Newfoundland coast, where the damp air from the ocean is chilled in passing over the cold Labrador current. On the other hand, ship canals have been built around the rapids and falls (Fig. 170), so that good-sized boats are able to go from the open ocean to the western part of Lake Superior, a distance of twenty-two hundred miles. This gives the Canadian route a great advantage over the Erie Canal route upon which only small canal boats can go.

There are many other large rivers in Canada besides the St. Lawrence River. Name them, and tell why most of them are of little value.

Railways have been of great importance in Canada, as in the United States. The leading railway is the Canadian Pacific, which extends from St. John, New Brunswick, entirely across Canada, to VANCOUVER, on the Pacific coast. It is the shortest route from England to China and Japan, and much freight is sent that way. Another important line is the Grand Trunk Railway.

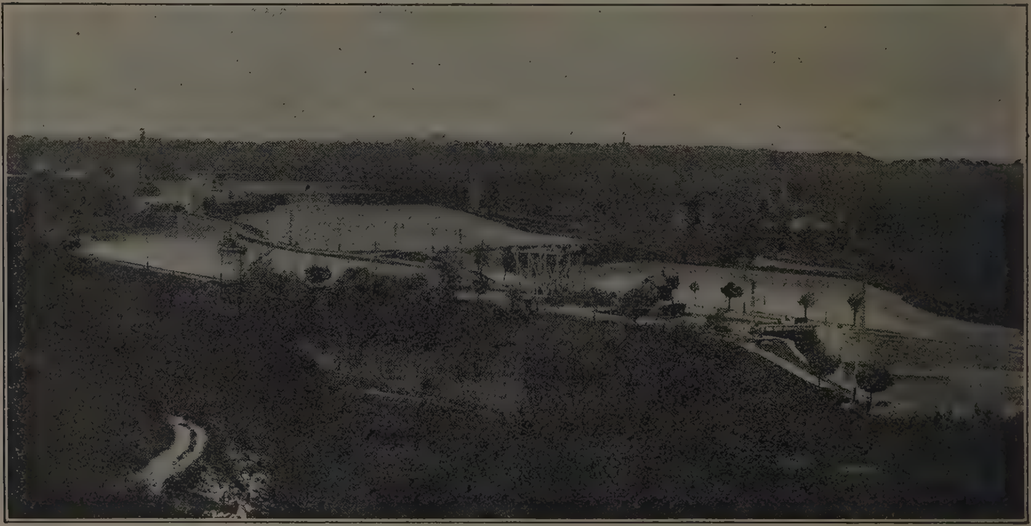

FIG. 170. — The Welland Canal, between Lakes Erie and Ontario. At this point there are two locks in the canal. Point them out. Why are they needed?

Leading cities

1. Along the St. Lawrence and Ottawa rivers

MONTREAL, the principal city in Canada, is on the St. Lawrence River (Fig. 171), at the mouth of the Ottawa River, and just below the Lachine Rapids. Thus goods from Europe may be carried by ocean vessel to Montreal, fully a thousand miles inland; then, by transfer to other ships, they may be taken on canals, rivers, and lakes as far as Duluth. By this means, and by railways also, raw products from the North, East, South, and West collect at Montreal, either to be manufactured, or to be shipped farther. In its extensive connection with the interior of Canada, by water and by rail, Montreal reminds us of New

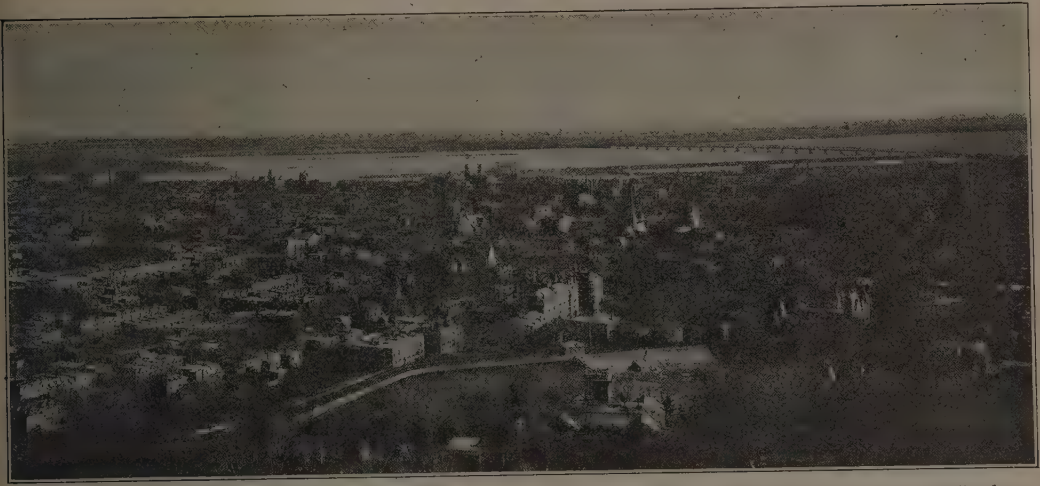

FIG. 171. — A view of Montreal from the hill called Mount Royal, which rises directly behind the city. In the distance is the broad St. Lawrence. Notice the long bridge crossing it.

York; but since it has a less productive territory to draw upon, it has grown far less rapidly than New York.

As in the large cities of the United States, there are many kinds of manufacturing in Montreal, including the making of sugar, boots and shoes, cotton and woolen clothing, India-rubber goods, furniture and other articles of wood, various steel and iron products and cigars.

Farther down the river is QUEBEC, which was once the center of the French government in Canada, and the principal city. It is situated on a high bluff rising above the St. Lawrence, and is fortified so as to command that river. The better location of Montreal, farther inland, has drawn the commerce away from Quebec. The advantage of Montreal's situation has been greatly increased by the building of ship canals around the rapids; also by the dredging of the St. Lawrence, thus deepening the channel so as to admit ocean vessels as far as the city.

Quebec is one of the quaintest and most interesting cities on the continent. It resembles a bit of the Old World, transplanted to America, and a visitor from the United States feels that he is indeed in a foreign country. There is some manufacturing there, such as the making of boots and shoes.

OTTAWA, the capital of the Dominion, is above Montreal, at some large falls in the Ottawa River. On account of this fine water power, it has much manufacturing, and is especially noted for its lumber manufactories. It has beautiful government buildings, known there as the *Parliament Buildings* (Fig. 172).

2. Along the Atlantic coast

What Canadian cities on the Atlantic coast have already been mentioned, and in what connections? One of these, HALIFAX, in Nova Scotia, is one of the oldest cities in Canada. Although it has an excellent harbor, Halifax has never become a great city. The reason is easily seen on examining the map (Fig. 164). The narrow peninsula of Nova Scotia is not large enough to supply raw materials and manufactured articles in sufficient quantity to make it a great shipping point, and the country farther west is too difficult to reach. It is much cheaper to send Western goods to Montreal, for shipment eastward, than to carry them by rail as far as Halifax.

New York and Montreal show clearly the reasons why some cities flourish; and Halifax

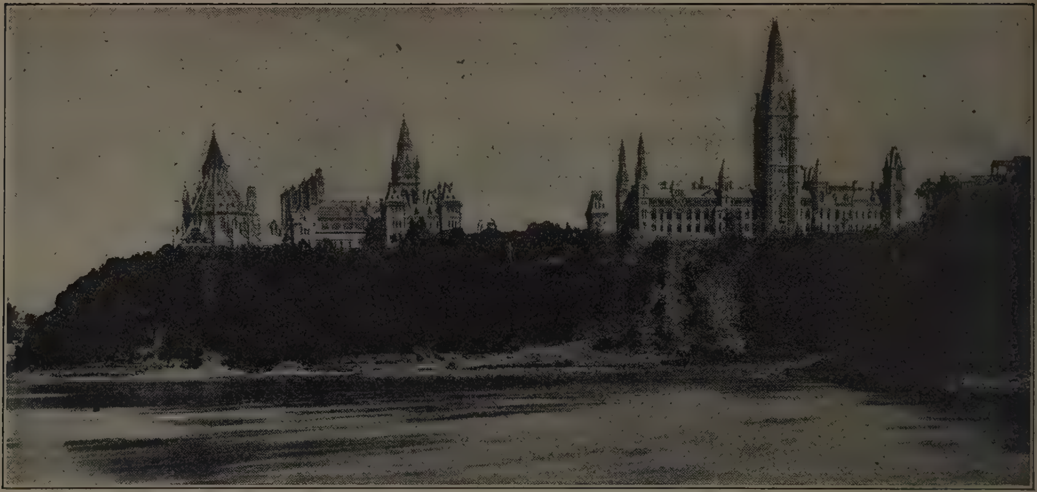

Fig. 172. — The Parliament Buildings at Ottawa.

is an equally good illustration of the reason why other cities fail to grow so rapidly.

3. Along the Great Lakes

Toronto, the second city in size in Canada, is located on an excellent harbor on the shores of Lake Ontario. Being in the midst of a fertile farming country, and having water connection with coal on the east and south, and with lumber and other raw products on the west, Toronto has become a great manufacturing center. At the same time it is one of the most attractive cities on the continent.

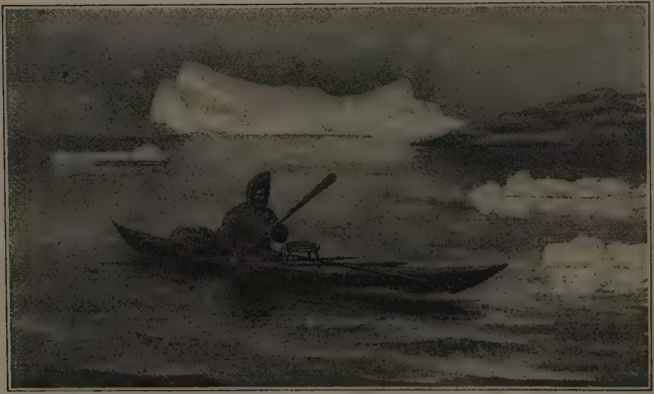

Fig. 173. — A Greenland Eskimo in his skin-boat, or kayak. In the distance are icebergs which have broken off from the great Greenland glacier.

2. Greenland

The Eskimos (Fig. 173) living on the west coast of Greenland are under the control of the Danes, who trade with them for skins, walrus, ivory, blubber, and eider down. The most northern of the Danish trading stations is Upernivik, which is the most northern point in the world where white men live. Some uncivilized Eskimos, however, have homes still farther north.

Most of Greenland is a barren waste of ice and snow — one of the most complete deserts in the world. There is no living thing to be found in the ice-covered interior. The extent of this land; and other facts about it, you have already studied in connection with the Great Glacier.

Review Questions

1. What two nations struggled for possession of Canada, and what was the result? 2. How many provinces are there in Canada, and what are their names? 3. What can you tell about Newfoundland? 4. Show

how fully the surface features of southern Canada correspond to those of our Northern States. 5. Describe the climate. 6. Where are the forests? 7. What is the method of lumbering, and what are the leading lumber centers? 8. Where are food fish caught? What kinds are caught? 9. What are the farm products in the West? 10. State the principal facts about ranching. 11. Where is the principal grain region, and what is the leading city there? 12. Where is the most populous farming section, and what are its products? 13. What about farming in southeastern Canada? 14. What can you tell about mining in British Columbia and Yukon Territory? 15. What mineral products are found in Ontario and southeastern Canada? 16. What are the conveniences for transportation? 17. Locate and tell the principal facts about the leading cities along the St. Lawrence and Ottawa rivers. 18. Along the Atlantic coast. 19. Along the Great Lakes. 20. What is the condition in Greenland?

Suggestions

1. Compare the area of Canada with that of the United States (Appendix, pp. 390 and 392). 2. Compare the populations (Appendix). 3. Read the story of "Evangeline." 4. Lake Erie is how much higher than Lake Ontario? How are ships able to pass from one lake to the other? 5. Why should Buffalo grow more rapidly than Toronto? 6. Of what advantage is it to the United Kingdom to have such a large, productive colony as Canada? 7. What books on Arctic travel have you read? Tell some of the things you have learned from them. 8. Read Nansen's "First Crossing of Greenland" or Peary's "Northward over the Great Ice." 9. Recall facts that you have already learned about the Eskimo.

VI. Countries South of the United States

Map study

Mexico. 1. Describe the relief of Mexico. 2. Name the two large peninsulas. 3. What river forms a part of the northern boundary? 4. What salt waters border Mexico? 5. Find the capital. 6. Find the seaport Vera Cruz. 7. Compare the coast line with that of the northeastern part of the United States.

Central America. 8. Name the countries. 9. What sea lies to the east? 10. What large lake do you find? 11. Examine the small map of the Panama Canal. Describe the route proposed. 12. Name the two cities at the two ends of the Canal.

West Indies (Fig. 161). 13. Find the Bahamas; the Lesser Antilles; the Greater Antilles. 14. Name the four largest islands in the West Indies. 15. In what zone do the West Indies lie? 16. What waters touch the shores of the West Indies? 17. What nation owns the Bahamas? 18. What other nations have possessions in the West Indies? 19. Locate the Bermuda Islands on the map (Fig. 4).

1. Mexico

History

1. The inhabitants

After Columbus discovered the West Indies, the neighboring coast of the mainland was visited and settled. Thus the Spaniards came into possession of Mexico and some of the country to the north, which now belongs to the United States.

The explorers found so much gold and silver in Mexico that many Spaniards settled there. They opened mines, and started coffee plantations, farms, and cattle ranches. Many of the Spaniards intermarried with the Indians, so that Mexico has a varied population. There are savage Indians, half-civilized Aztecs, Spanish and Indian half-breeds, and some pure-blooded Spaniards.

2. The government

Spain governed Mexico so badly that the people finally rebelled, and in 1821 won their independence. They then established a republic with a government modeled after our own. There are twenty-seven states, each with a government and capital, somewhat like our states; and there are three territories. There is also a central government, with the capital at Mexico City, where the president lives.

3. Loss of territory

For a long time Texas, New Mexico, and Colorado, together with the country west of them to the Pacific, were a part of Mexico. Texas won its independence by war, and joined our Union; and as a result of our war with Mexico, called the Mexican War, the United States obtained all the territory which in Figure 219 is marked "Mexican Territory ceded 1848."

Mexico consists of four sections, at different heights above sea level. The lowest

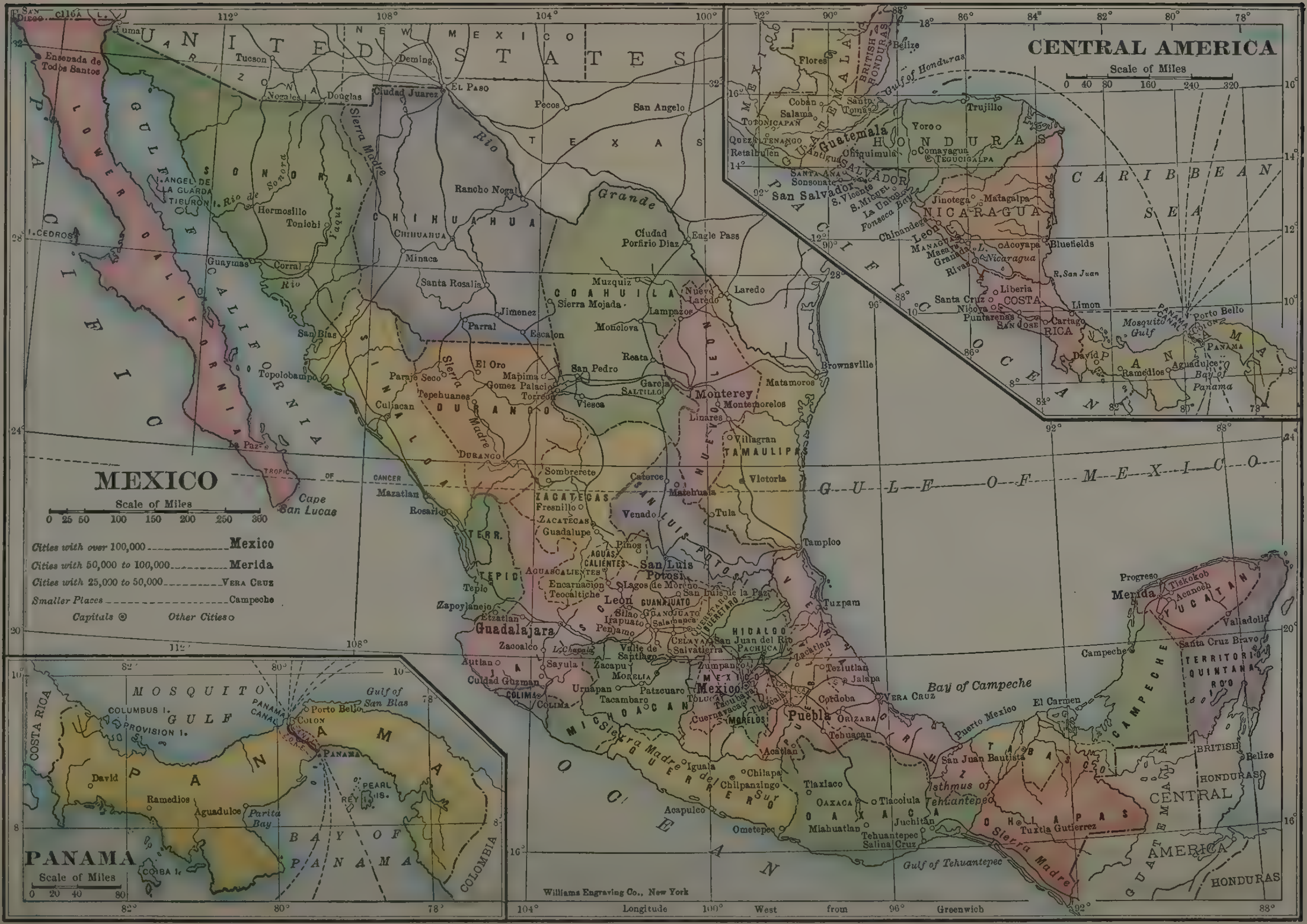
MEXICO
Scale of Miles
0 25 50 100 150 200 250 300
Cities with over 100,000 Mexico
Cities with 50,000 to 100,000 Merida
Cities with 25,000 to 50,000 VERA CRUZ
Smaller Places Campeche
Capitals ⊙ Other Cities ○
CENTRAL AMERICA
Scale of Miles
0 40 80 160 240 320
PANAMA
Scale of Miles
0 20 40 80
UNITED STATES
GULF OF MEXICO
PACIFIC OCEAN
CARIBBEAN SEA
GULF OF CALIFORNIA
LOWER CALIFORNIA
Bay of Campeche
Gulf of Tehuantepec
Longitude West from Greenwich
Williams Engraving Co., New York

FIG. 174.

Surface features

1. The four sections at different altitudes

of these is a coastal plain, and other lowlands, near the sea (Fig. 175). The second includes the slopes that extend toward the highlands of the interior. The third is the highland itself, a broad table-land, or plateau, occupying a large part of the interior of the country (Fig. 176). The fourth consists of mountain ranges and peaks, which are a continuation of the Cordillera of our Western States. Among the mountains, as in the United States, are volcanic cones, two of them, Orizaba and Popocatepetl (Fig. 179), being among the highest peaks on the continent.

2. Its rivers

The divide of this narrow part of North America extends from north to south, sending some of the streams eastward, others westward. Thus all the streams of the country are short. They have a rapid fall in descending from the interior plateau, and have cut deep canyons in its edges. In addition, the streams pass through such an arid country that they have little water. Rivers of this kind are not useful for navigation. This lack of large, navigable rivers has greatly interfered with the development of Mexico. Suggest why.

3. The coast line and harbors

As in our Southern States, the land has been rising instead of sinking. Therefore the coast is regular, and there are few good harbors. There are two large peninsulas projecting from the mainland. One of these is Yucatan; the other is Lower California, a southern extension of the mountains of our Western States.

Climate

Mexico has four different kinds of climate, corresponding somewhat closely to the four areas of different altitudes. The low coastal plains, near Vera Cruz and in Yucatan, have the hot climate of the tropical zone (Fig. 175), with abundant rain brought by the damp winds that blow across the Gulf of Mexico and the Caribbean Sea.

On the slopes west of these plains the temperature is not so hot, but there is much rain. This belt has a subtropical climate.

The interior plateau is so high that the climate is temperate, even in the part that lies south of the Tropic of Cancer; but there is so little rain that the country is arid (Fig. 176). The climate becomes steadily cooler the higher one goes. Indeed, even within the tropical zone, there are places among the mountains where the snow never melts, and where there are true glaciers. On these high mountain slopes the rainfall is quite heavy.

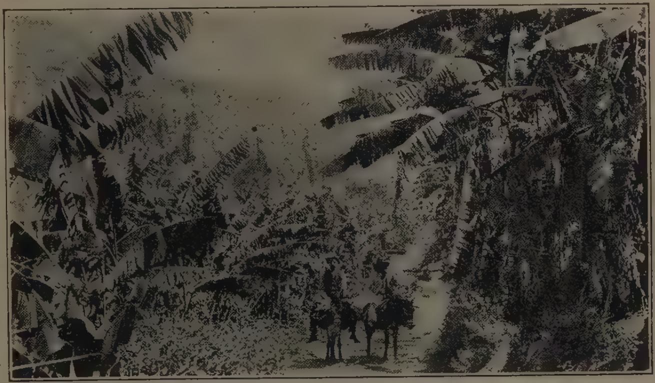
Fig. 175. — A view in the tropical lowlands of Mexico near the coast, called the "hot lands." The road is bordered by banana trees.

Products from forest trees and other native plants

In the greater part of Mexico forests are rare, except upon the higher mountains. In fact, there is so little forest on the arid plateau that the inhabitants find difficulty in obtaining wood for fuel. Much of this is dug from the ground; for some of the arid-land bushes, such as the mesquite, have long, thick roots which make excellent firewood. The other plants found in the arid lands resemble those of our Western States.

In southern Mexico and on the damp lowlands, on the other hand, there are dense tropical forests. In these are found many valuable woods, such as mahogany, rosewood, and logwood. The rubber tree also grows here, and large quantities of rubber are obtained.

One of the most valuable of the native plants is the heniquen, a variety of hemp, which thrives in Yucatan. Among the exports of Mexico, this and other fibers rank next in value to mineral products, most of the fiber going to the United States.

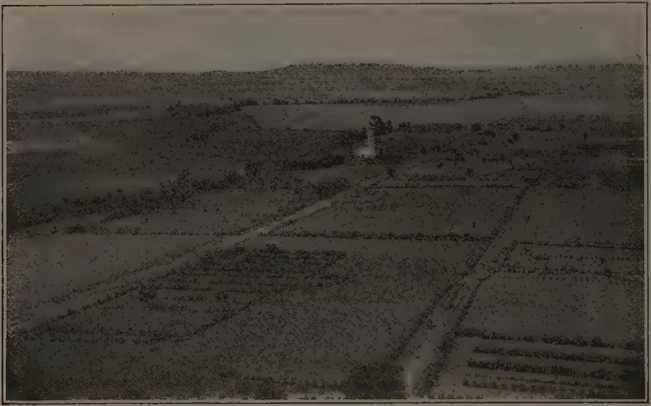

FIG. 176. — Irrigated fields on the plateau of Mexico. The rows of plants on the right are maguey.

Another product is the vanilla bean, which grows upon a climbing plant. In the seed-pod are nestled the fragrant beans which are used for making flavoring extracts, for perfumeries, and for medicine. Pepper, made from the dried berry of a tropical plant, is obtained in Mexico. Indigo, useful as a dye, is likewise obtained from a berry in this region; and sarsaparilla is extracted from the roots of a tropical plant that grows here.

Agriculture

Although the climate of a large part of Mexico is arid, agriculture is the principal industry of the people. This is partly due to the snows and rains among the mountains, which supply water for irrigation. On the irrigated farms the products of the temperate zone are raised, such as wheat, corn, and beans — the latter being one of the staple foods of the Mexicans. Much fruit is also produced, especially apples, pears, peaches, and grapes.

1. On the arid plains

(1) Products by irrigation

A species of native arid-land plant, called *agave*, is of great value. The stout, sharp-pointed leaves of the agave rise in a tuft from near the ground; in the center stands the flower stalk, which sometimes reaches a height of forty feet, and which bears a cluster of white flowers on the top. This is also called the century plant, because it requires so long (from ten to seventy years) to mature and produce this flower stalk. From the juice of the agave the Mexicans obtain an alcoholic drink known as pulque, and another known as mescal. The tough leaves of some varieties of agave contain a fiber which is made into paper and a strong thread; and from the juices of one kind, called the *maguey*, soap may be made. So valuable is the maguey that it is carefully cultivated upon plantations.

(2) Farming methods; and home life

The Mexican farming methods, which are very crude, are a mixture of ancient Aztec customs and those introduced from Spain several centuries ago. One may still see the wooden plow which barely scrapes the ground; and also the wooden-wheeled cart drawn by oxen. There are, however, many farmers who have adopted the same methods of farming as we have; and every year their number is increasing, for Mexico is now advancing rapidly.

The home life of the people is interesting. Their houses have but one story, and are commonly built of sun-dried bricks, or *adobes*, held together by layers of mud. Often there is but one room (Fig. 177), the ceiling being made of brush, and the floor of nothing but earth or stones. In this one room the whole family cook, eat, and sleep. Their food consists of very simple materials, such as unraised bread, baked in the fireplace, beans, and sometimes meat, commonly cooked with red pepper. Men, women, and even children use tobacco.

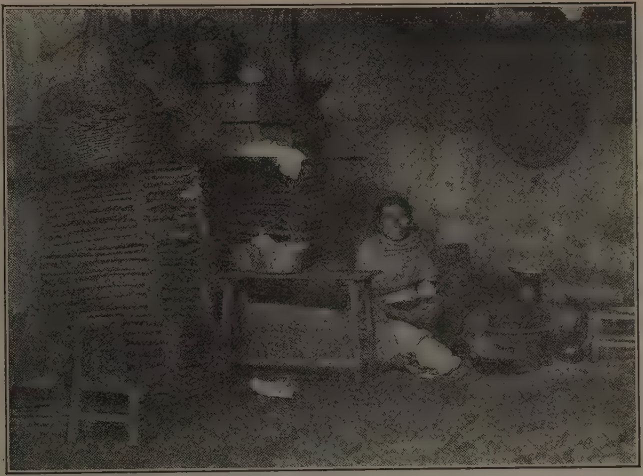

FIG. 177. — Interior of a Mexican adobe house.

While this description is true for the poorer classes, it of course does not apply to the wealthier and educated Mexicans. But even these have adobe houses, which somewhat resemble those of southern Spain.

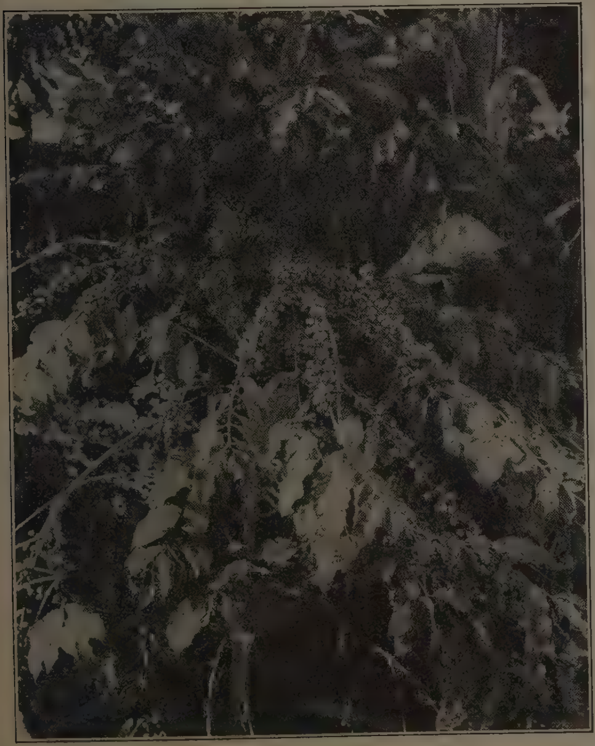

FIG. 178. — Coffee tree and berries growing in the shade of higher trees.

(3) *Ranching*

So much of Mexico is arid that large sections are suited only to grazing. For this reason, one of the leading industries is ranching. As in our Western States, there are extensive cattle and sheep ranches; and hides, meat, and wool are important exports.

2. On the lower, humid lands

On the damp lowlands, the farm products are quite different from those on the arid plateau. There rice, sugar cane, and cotton are produced; also tropical fruits, such as oranges, bananas, cocoanuts, and pineapples. Upon the slopes between the tropical lowlands and the temperate plateau much cotton, tobacco, and coffee are raised.

Coffee, one of the most valuable products of Mexico, requires a rich soil, abundant moisture, a warm climate, and plenty of shade. In order to secure shade, the coffee bush, which reaches a height of from ten to fifteen feet, is planted in the shade of higher trees. A white

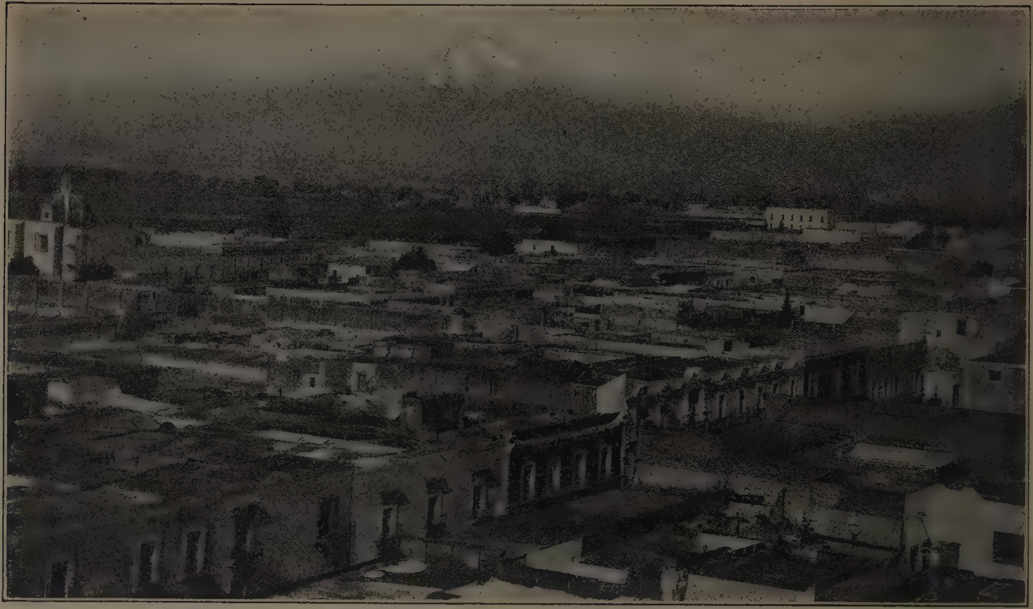

FIG. 179. — A view of a part of Mexico City, with the snow-capped cone of the volcano Popocatepetl rising in the distance.

blossom appears as early as March, and after the flower falls off, the coffee berry begins to grow (Fig. 178). It resembles a dark red cranberry. The coffee is inside of this berry in the form of two kernels, and the husk must be removed in order to prepare such kernels for market.

One of the principal objects of the Spaniards in exploring the New World was to obtain gold and silver; and they were rewarded in their search by the discovery of rich mines both in Mexico and South America. Some of these mines had been worked by the Indians; others were found by the Spaniards themselves. Mexico is still a great mining country, rivaling the United States in the production of silver.

Mining

1. Extent of minerals

Much gold, copper, lead, and zinc are also produced, and recently great quantities of petroleum have been found on the coastal plain, as in Texas and Louisiana. A large amount of iron is known to exist in several parts of the country. At one place, near DURANGO, there is an iron mountain which contains an enormous amount of very rich ore. Here blast furnaces have been erected, and steel rails and other iron goods are manufactured. Find this city on the map.

Manufacturing

Because of the ignorance of the working people, and the scarcity of coal, there is not a great deal of manufacturing in Mexico; and that which is done is largely carried on by hand. Some of this hand work is very beautiful, for even the uneducated Mexicans are quite artistic.

There are large tobacco factories in the tobacco district, and smelters in the mining regions. Some earthenware is also manufactured, and some cotton cloth. Indeed, cotton manufacturing is growing rapidly in importance, the cotton used being what is grown in Mexico. More money is now invested in cotton mills than in any other form of manufacturing.

There are no large manufacturing towns

such as we find in many parts of the United States; but Mexico is making rapid progress. There is much water power where the streams descend from the plateau, and this is being used for producing electricity. Railroads, too, are being built in many parts of the republic. But, most important of all, those now in control are encouraging all kinds of industry and providing better facilities for education.

Leading cities

1. In the interior

Wherever possible, the Mexicans have collected in cities or towns. This has been necessary in many sections in order to obtain the water supply needed for irrigation. It is usually too great a task for a single farmer to build a ditch; and therefore a number combine and thus live close together.

There are a few large cities, the greatest being the capital, MEXICO CITY (Fig. 179), built on the site of an ancient Aztec Indian city. It is situated on a high plateau and therefore, although so far south, has a cool climate. In this city, as elsewhere in Mexico, there are many fine churches and other notable buildings. Another city in the interior of Mexico is PUEBLA, founded in 1531. It also is situated near one of the ancient cities, or pueblos, of the Aztecs. GUADALAJARA is a third important Mexican city. Locate each of these cities.

2. On the coast

Since the eastern coast of Mexico is low and sandy, it has no good harbors. The two largest cities there are TAMPICO and VERA CRUZ, whose harbors are protected by breakwaters. There are some good harbors on the western coast. One of these is ACAPULCO, but since it is backed by high mountains and a thinly settled country, that port has never become of much importance.

2. Central America

Names of the countries and their government

Of the six Central American republics, the smallest is Salvador; the next, Costa Rica. Nicaragua, Honduras, and Guatemala are about equal in size. These are all in North America; but the Republic of Panama is partly in North America and partly in South America. It has a special interest for us. Why (p. 141)?

These six countries are independent of each other, and each has a form of government modeled after that of the United States. In addition to these countries, on the eastern side of the Yucatan Peninsula is British Honduras (or Belize), a colony of the United Kingdom.

The inhabitants of the Central American

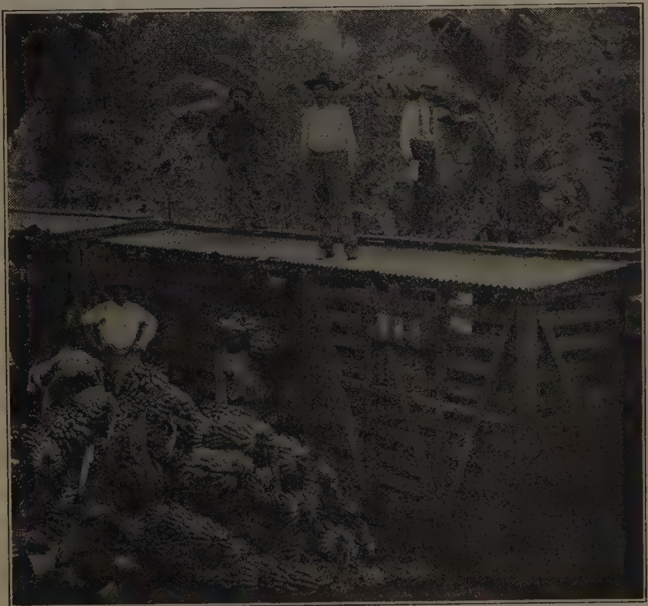

FIG. 180.—Loading bananas on a banana plantation in Costa Rica. The bananas are then taken to the coast and placed on steamers to be shipped to the United States.

Character of the people

republics are mainly Indians, Spaniards, and half-breeds. The great majority are uneducated, and many are even uncivilized.

Character of the region

Most of Central America is mountainous, and is subject to volcanic eruptions and to earthquakes of great violence. The earthquake shocks have leveled towns and killed thousands of people. For instance, San Salvador, the capital of Salvador, was so frequently destroyed by earthquakes that the inhabitants decided to choose a new location for their city; but this is scarcely better than the old one.

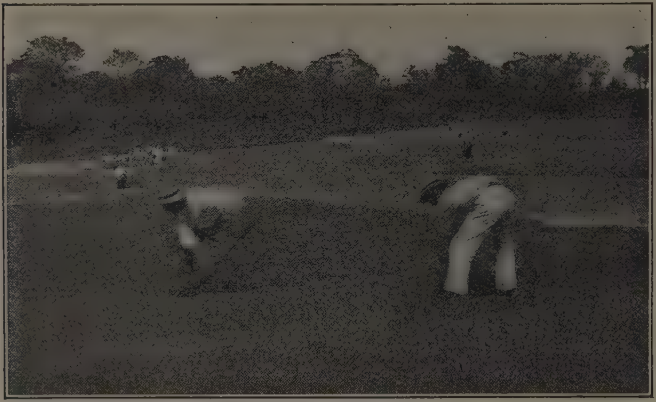

Fig. 181. — Drying coffee berries in Costa Rica. There are tons of coffee berries here spread out in the sun to dry. After they are dried, the husk is removed and the bean is then shipped away.

Since these countries lie in the tropical zone, the climate is hot. The rainfall is heavy, especially on the eastern coast, where there are dense jungles.

The products

A large portion of these countries is occupied by dense tropical forests, from which are obtained mahogany, rosewood, logwood, fustic, and other valuable cabinet and dye woods. The rubber tree also grows here, and the production of rubber is an important industry.

As in Mexico, coffee is raised on the hill slopes in the shade of the forest trees. Costa Rica is one of the most important coffee-producing districts (Fig. 181). Bananas (Fig. 180), sugar, tobacco, indigo, and cocoa are other products.

Some gold and silver are obtained, the former near Bluefields, the latter in Honduras. Manufacturing is little developed.

The leading city

The largest city in Central America is New Guatemala, the capital of Guatemala. This city, which was formerly situated at the base of two very active volcanoes, was changed to a safer site; hence the name *New Guatemala*.

3. The West Indies (See the Map, Fig. 154)

Location and names of the groups of islands

A chain of islands reaches from the Yucatan and Florida peninsulas to the mouth of the Orinoco River on the South American coast. These islands inclose the Caribbean Sea; and, also, with the aid of the peninsulas of Florida and Yucatan, the Gulf of Mexico. All of this archipelago, excepting the Bahamas, lies entirely within the tropical zone.

These islands, scores of which are very small, are called the West Indies, because Columbus thought he had reached India. With the exception of the Bahamas, they are also known as the Antilles. Those on the north, including the larger ones, are called the Greater Antilles; and those on the south, the Lesser Antilles.

The Greater Antilles

Two of the Greater Antilles have already been described (p. 138). What do you remember about them?

1. Jamaica

(1) Government and people

South of Cuba lies the island of Jamaica, the third in size in the West Indies, and a possession of Great Britain. The inhabitants are mainly either negroes or mulattoes, there being fully forty blacks to one white person.

(2) *Products*

This island is mountainous in the center, but has excellent soil on the lower slopes and in the valleys, and is very productive. The chief occupation is agriculture, and the women are employed in outdoor work as much as the men. One of the main products is sugar cane. Early vegetables and fruits, such as oranges and bananas (Fig. 182), are also raised. Jamaica ginger, of which every one has heard, is obtained from the root of a plant that grows in this island.

The climate and scenery are very attractive, and many people from the United States go there for a part of the winter. Regular ocean steamers carry passengers, together with great quantities of tropical fruits and vegetables.

(3) *Earthquakes*

As in other islands of the West Indies, earthquakes are common. One of these, in 1906, caused great destruction in Kingston, the capital and leading city.

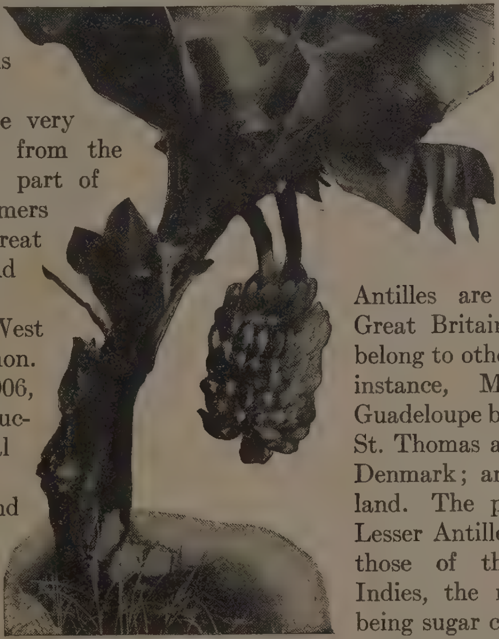

Fig. 182. — Bananas as they grow, hanging in great bunches from the broad-leafed banana tree.

2. Haiti

(1) *Government*

Haiti was the first large island discovered by Columbus, and on it he made settlements and opened mines. Like the other Greater Antilles, this became an important Spanish colony; but Spain lost one island after another, the last to go being Cuba and Porto Rico (p. 138). Haiti has long been independent, and there are now two republics in the island — Haiti and Santo Domingo. The capital of the former is Port au Prince; and of the latter, Santo Domingo. They are not very progressive republics, and, as in Central America, revolutions are very common. Most of the inhabitants are negroes and half-breeds, descendants of the slaves of the Spanish settlers; but there are more white people in Santo Domingo, which is more progressive than Haiti.

(2) *Products*

Many of the natives obtain their living in the most primitive fashion, like the negroes of Africa; but others, especially near the seacoast, are engaged in raising sugar, tobacco, coffee, and bananas. There are valuable woods covering much of the island, and some mineral wealth; but little is done with these resources.

The Lesser Antilles

1. Government and products

Most of the islands among the Lesser Antilles are possessions of Great Britain, though some belong to other nations. For instance, Martinique and Guadeloupe belong to France; St. Thomas and St. Croix to Denmark; and some to Holland. The products of the Lesser Antilles are similar to those of the other West Indies, the most important being sugar cane.

2. Volcanoes and earthquakes

These small islands are volcanic cones. Most of the volcanoes are now extinct, but in Martinique and in St. Vincent there have been violent volcanic outbursts. One of the most terrible volcanic eruptions ever recorded occurred in Martinique in 1902. After being quiet for about fifty years, Mont Pelée suddenly burst forth and completely destroyed the beautiful city of St. Pierre, which was situated at its base. In a few seconds all of the inhabitants, over twenty-five thousand people, were killed by the cloud of steam and hot ash which descended upon them.

North of Haiti and Cuba are several hundred small islands called the Bahamas, which belong to Great Britain. A number of these are inhabited, and on one is situated the city of NASSAU.

The Bahamas

1. Government and chief city

2. How the islands were made; also occupations and products

These islands, like the coast of southern Florida (p. 56), have been made by coral polyps. One of the products is the sponge, which grows in the clear, warm waters of the Bahama banks. To obtain sponges, the inhabitants either cruise about in boats, raking them up, or they dive into the clear water, tearing them from the bottom.

On the land, early vegetables, pineapples, oranges, and cocoanuts are raised by the inhabitants, who are chiefly negroes. One of the industries, as on the neighboring coast of Florida, is caring for winter visitors. Why should people wish to go there?

4. The Bermudas (Fig. 4)

Location and climate

Far out in the Atlantic, six hundred miles east of the Carolinas, and alone in mid-ocean, is a cluster of islands, known as the Bermudas. The largest is only fifteen miles long and one or two miles wide. Being in the open ocean, and surrounded by warm ocean currents, these islands have a delightful and equable climate. In midwinter, when people in the same latitude in the United States are shivering with cold, those in the Bermudas are able to sit out of doors in comfort, both day and night.

People and occupations

This group of islands, which belongs to Great Britain, is inhabited mainly by negroes and mulattoes, who are engaged in raising early vegetables for the American market, especially potatoes and onions. Another important product is the Easter lily, great fields of which are cultivated for the Easter season. Many persons from the United States are attracted here every winter, most of whom stay in the largest city, HAMILTON.

Review Questions and Suggestions

MEXICO: QUESTIONS. 1. Give some facts about the history of Mexico. 2. Explain about the four sections in Mexico that have different altitudes. 3. Tell about its rivers. 4. Its coast line and harbors. 5. Its climate. 6. What are the products from the forest trees, and other native plants? 7. What agricultural products are obtained by irrigation? 8. Describe the farming methods and the home life in the arid lands. 9. Where is ranching carried on? 10. What products are obtained from the lower humid lands? 11. What about the extent of minerals in Mexico? 12. What is the condition of manufacturing? 13. Name and locate the leading cities in the interior. 14. On the coast.

SUGGESTIONS. 15. Find out why coffee raising requires special care. 16. Find an article of furniture made of mahogany. 17. Walk toward Mexico City. 18. What reasons can you give for its location? 19. Who is the president of Mexico? 20. Make a sketch map of Mexico.

CENTRAL AMERICA: QUESTIONS. 21. Name the countries here, and tell their form of government. 22. What is the character of the people. 23. Describe the region. 24. What are the products? 25. Name and locate the leading city.

SUGGESTIONS. 26. What disadvantages do you see in the lack of a central government for all the Central American republics? 27. In what other ways, besides saving coal, has the canal across Panama proved of advantage? Let a committee be appointed from your class to obtain definite facts about the matter. 28. Why will harbors at each end of the canal be necessary? 29. Make a sketch map of Central America.

THE WEST INDIES AND THE BERMUDAS: QUESTIONS. 30. Locate the West Indies, and give the names of their principal groups. 31. Tell what you can about the government, people, and products of Jamaica. 32. The earthquakes there. 33. What can you tell about Haiti? 34. State important facts about the Lesser Antilles. 35. About the Bahamas. 36. How are the Bermudas important? Locate them.

SUGGESTIONS. 37. How does each of the largest four of the West Indies compare in area and population with New York State? (See tables in Appendix, pp. 390 and 391.) 38. Find out more about the eruption of Mont Pelée.

VII. REVIEW OF NORTH AMERICA

The story of our continent

The natural advantages that North America possesses as a home for man have been the result of slow changes extending through millions of years.

How has our coal been formed (p. 5)? Describe the formation of other minerals.

What great mountain systems have been produced (p. 7)? What about their height? What are the names of the principal ranges in the Cordillera? What do you know about the formation of the Mississippi Valley?

What portion of the continent was covered by the Great Glacier (p. 7)? Mention some of its important effects (pp. 6–8).

In what ways has the sinking or rising of the coast been important (p. 5)? State the present size and shape of the continent (p. 1). Show the importance of its position.

Its plants, animals, and peoples

Describe the plants and animals of the Far North (p. 9). Of our arid West (p. 10). What about the plants and animals in other parts of the temperate zone (pp. 10–11)? About those of the torrid zone (p. 11)?

Describe the manner of life of the Indians (p. 12). Why did they never become more powerful?

What European nations tried to obtain possession of large portions of this continent (p. 13)? Give some reasons why the English succeeded most fully (p. 13).

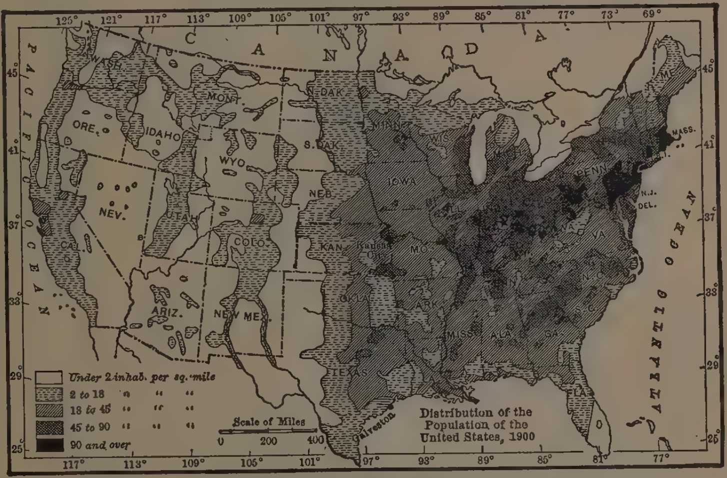

FIG. 183. — Distribution of population in the United States, 1910.

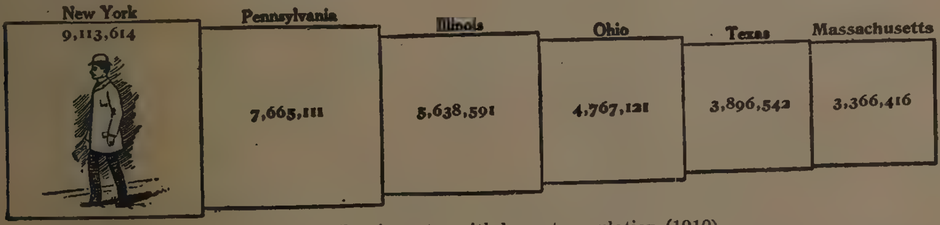

FIG. 184. — The six states with largest population (1910).

I. The United States

Population

1. Distribution of people in North America

At present there are probably as many as a hundred and twenty-five million persons living in North America, distributed among the four chief sections as follows: Central America, over five million; Canada, over seven million; Mexico, over fifteen million; and the United States (not including dependencies), more than ninety-one million (Fig. 183). From these figures it

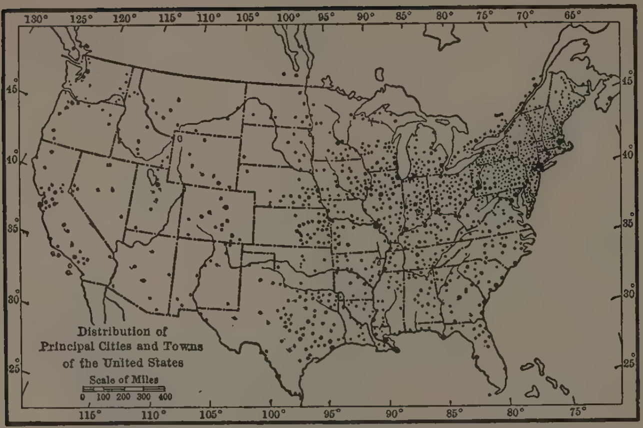

Fig. 185. — Map showing distribution of cities.

is clear that about three fourths of all the inhabitants of the continent are living in the United States.

2. Distribution of people in United States

Figure 183 shows more clearly than Figure 184 the density of population in the different parts of the Union. Where are the most thickly settled portions? The most sparsely settled? How can you explain such distribution (p. 15)? Name in their order the six states having the greatest population (Fig. 184). Find the center of population (star in Fig. 183).

3. Number in cities, and in the country

Figure 185 gives the location of the cities, the largest having the largest dots. In the Appendix (p. 392) is a table of the twenty-five largest cities. Find the dots (Fig. 185) that represent several of these. In what respect are the two figures (183 and 185) alike?

The great cities are so numerous, and have been so often mentioned, that there is danger of valuing them too highly, as compared with the country. At the time of George Washington very few people lived in cities. Even at present about two thirds of our ninety-one million inhabitants live either in the country, or in towns with a population of less than eight thousand. In Mexico and Canada the proportion living in the country is still greater. In other words, the great majority of persons in North America are country people.

There are over five million families occupying farms in the United States. About how many persons does that represent? Why should so many people live on farms? The leading occupations of persons living outside of the cities are agriculture, lumbering, fishing, and mining. The most important of all is agriculture.

Agriculture
1. Grains

Figure 186 shows the regions that are most extensively engaged in raising corn. What states are included? In 1910 over two and a half billion bushels were produced. How many bushels

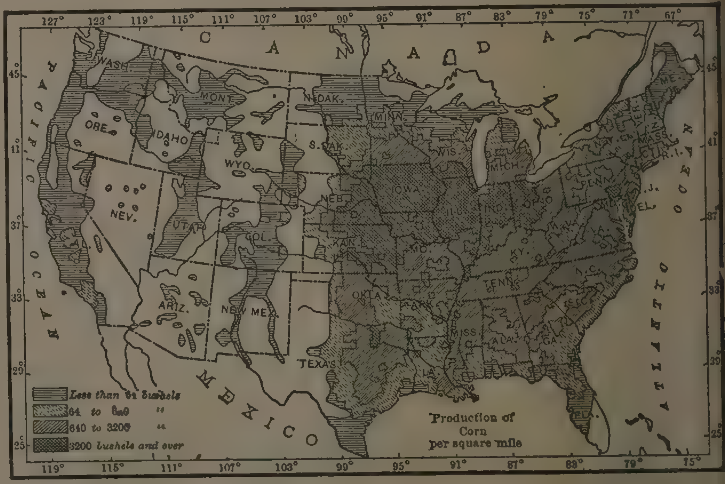

Fig. 186. — Map showing the regions of corn production in the United States.

is that for each of our inhabitants? How is corn cultivated, and what are its uses (p. 86)? Which are the six leading states in corn production, and how do they rank (Fig. 187)?

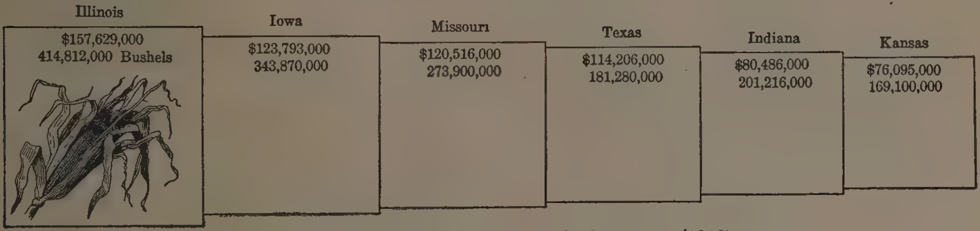

FIG. 187. — The six leading corn-producing states (1910).

Many of the states that raise corn are also extensively engaged in the wheat industry. Figure 188 shows the principal wheat regions. Where are they? What can you tell about wheat in the valley of the Red River of the North (p. 87)? What are the uses of wheat? What states on the Pacific coast produce wheat? Name the six leading wheat states in the order of their importance (Fig. 189).

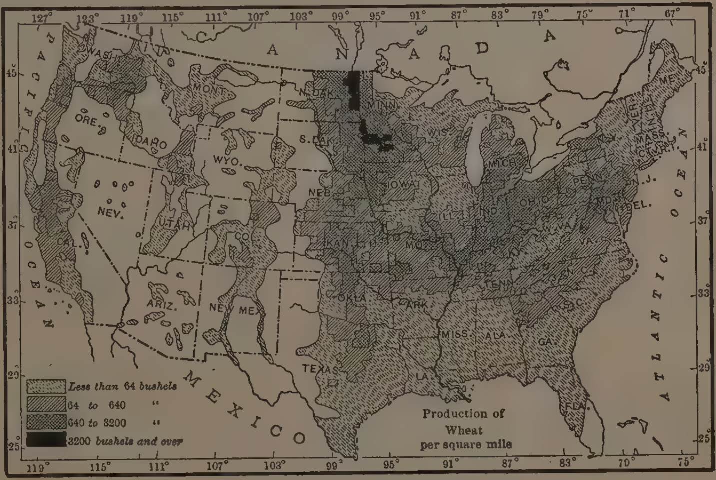

FIG. 188. — The wheat regions of the United States.

Corn and wheat are our most valuable food crops. Why is so little of either raised in the western half of the United States (p. 107)? Why so little in New England (p. 28)? What other grains do we raise, and for what is each used?

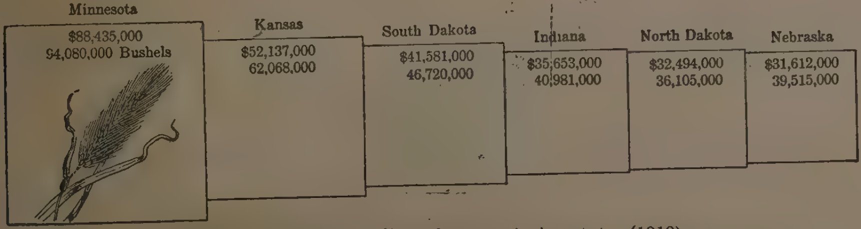

FIG. 189. — The six leading wheat-producing states (1910).

2. Cotton, sugar cane, and rice

The cotton belt is confined entirely to the southeastern portion of the country, as shown in Figure 190. Why? Name the principal cotton-raising states and give their rank (Fig. 191). What do you know about the growth and uses of cotton (pp. 56 and 57)?

Where in these states are sugar cane and

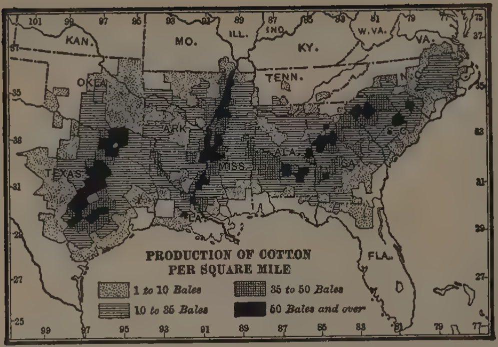

FIG. 190. — Map showing the cotton-producing states.

rice grown? How is each cultivated (pp. 57 and 58)? How does Louisiana rank with our dependencies in the production of sugar cane (Fig. 192)? What are the other sources of sugar? Where is beet sugar produced (Fig. 192)?

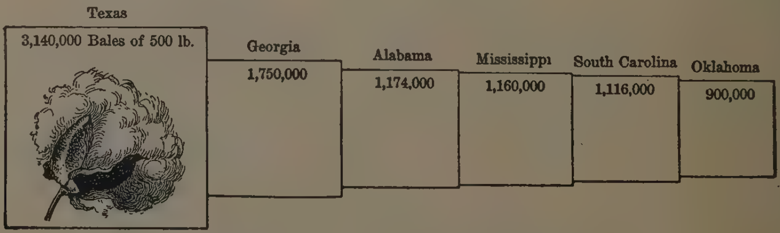

FIG. 191. — The six leading cotton-producing states (1910).

3. Tobacco

According to Figure 193 what states are largely engaged in tobacco growing? What is the appearance of the plant, and how is it prepared for use?

4. Fruits and vegetables

Name fruits and vegetables that are extensively raised in the United States. Figure 194 shows the sections that produce large quantities of fruit. What fruits are grown along the coast of the Northeastern States (p. 29)? In Florida, Cuba, and Porto Rico?

Why is the region near the Great Lakes especially suited to fruit raising (p. 88)? What fruits are extensively grown there (p. 88)? Why is truck farming especially important in the Northeastern States (p. 28)? Where are early vegetables extensively raised (p. 60)?

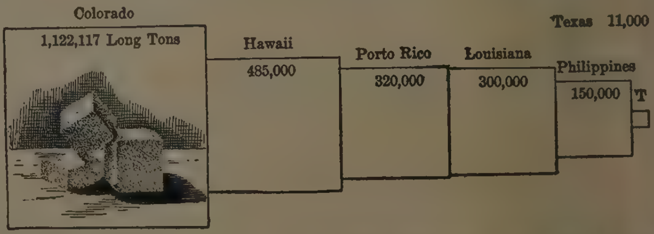

FIG. 192. — The six leading sugar-producing sections in the United States and its dependencies. Colorado, beet sugar; others, cane sugar (1910).

Name and locate the principal irrigated sections in our Western arid lands (Fig. 195). What are their products (pp. 117–120)?

Following are three figures showing the principal states from which other important farm products come: —

5. Other leading farm products

How does the value of hay (Fig. 196) in New York compare with that of corn in Iowa, and of wheat in Minnesota? Note that the states raising most corn (Fig. 187) correspond rather closely with those raising most hogs (Fig. 197). Why is that? Name the six leading dairy states (Fig. 198).

6. Grazing

Point out, on the map (Fig. 23), the portions of the country largely given up to grazing. Why these? Relate how cattle ranching is carried on (p. 90); also sheep ranching (p. 121). Which states are most important in these industries

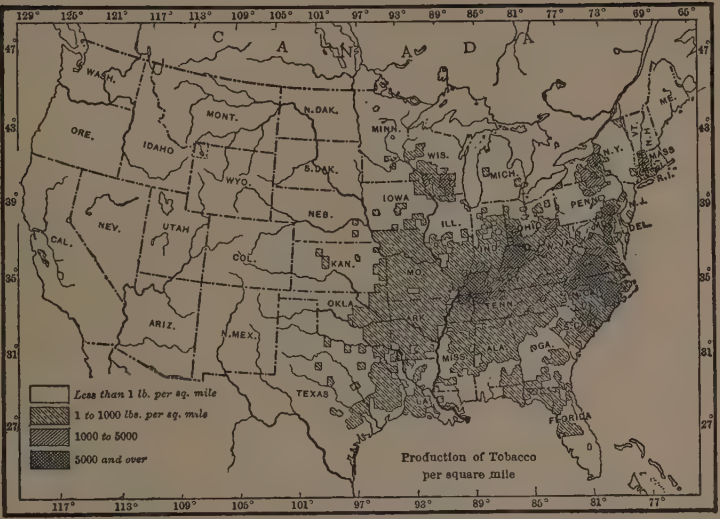

FIG. 193. — Map showing the tobacco-producing states.

(Figs. 199–200)? What are the uses of ranch cattle (p. 97)? Of sheep (p. 122)? In which states are most horses raised (Fig. 201)?

Lumbering

Name the leading lumber-producing states (Fig. 202). Describe the industry as it is carried on in Maine (p. 30); in the Southern States (p. 63); in the Central States (p. 92); in the Northwest (p. 115). Why these differences? Which are the most common kinds of trees in each section? What are the products of the forests besides lumber (pp. 66 and 67)? What states produce the greatest amount of lumber at present (Fig. 202)? Where are the leading forest reserves? Of what value are they?

Fishing

In what sections is fishing especially important (Fig. 203)? What fish are caught on our Eastern coast (p. 31)? On our Pacific coast? Tell what you can about the fishing industry in Alaska. Describe how codfishing is carried on (p. 32); salmon fishing (p. 116); the oyster industry (p. 63).

Mining

About four hundred thousand men in our country are employed in mining. How many different metals can you name? How many other mineral products can you mention?

1. The fuels

Of all the minerals, the *fuels* are probably the most important. Why? What kinds are there? Figure 204 shows how extensive the *coal beds* are. Name the states in which the greatest quantities of coal are mined (Fig. 205). Of what importance is it that there are coal fields in so many parts of the country? What kinds of coal are there? What are the differences between them?

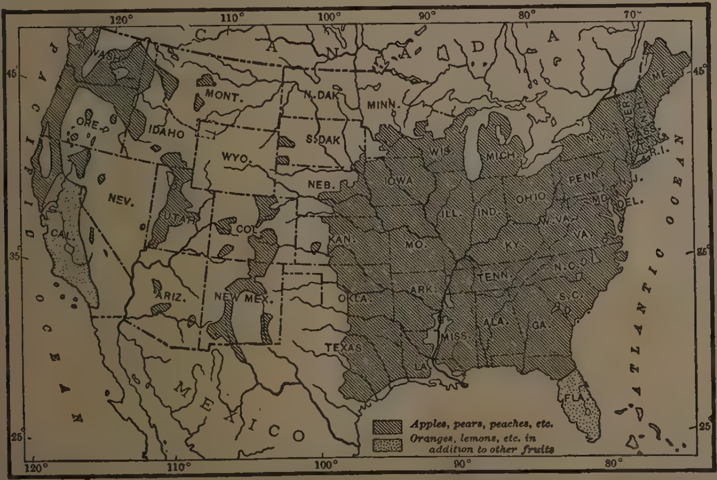

FIG. 194. — Map showing the leading fruit-growing regions of the United States.

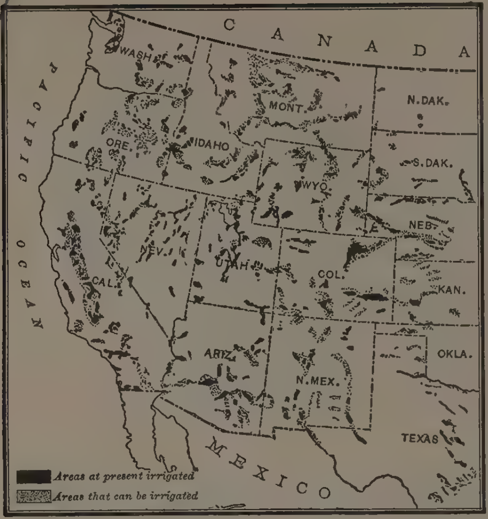

FIG. 195. — Map showing irrigation in United States.

Describe the method of mining coal (p. 35). What are the uses of coal?

Name the chief sections in which petroleum and natural gas are found (Fig. 207). Tell also how they have been produced and what their uses are (p. 34).

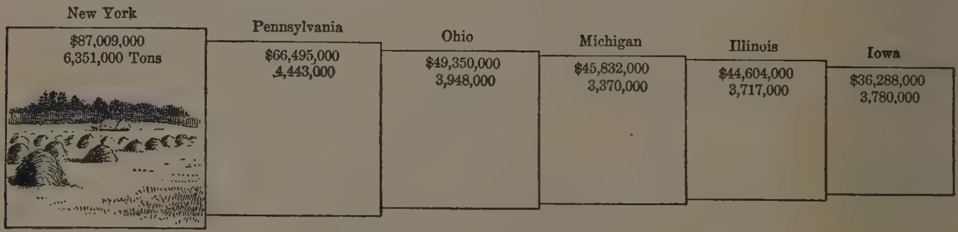

FIG. 196. — The six leading hay-producing states (1910).

2. Iron ore

The ores of iron are among the most important of the mineral products. Why so important? Where are the principal iron-producing regions (Fig. 204)? How is pig iron made (p. 37)? Why is not the Lake Superior district a favorable place for smelting iron ore? Name the six states that lead in production of iron ore (Fig. 206).

3. Precious metals

Describe the methods of gold mining (p. 112). What can you tell about gold and silver mining in California and Colorado (p. 112)? In what other parts of our country are the precious metals found (Fig. 207)? How does the value of the gold produced in the six leading states (Fig. 208) compare with that of the silver in the six leading states (Fig. 209)?

4. Other mineral products

What states are most noted for copper mining (Fig. 207)? Describe that industry in the two leading sections (pp. 95 and 113). Where and how is stone quarrying carried on in the Northeastern States (p. 33)? How is salt obtained in New York (p. 33)? What other valuable mineral products can you name (pp. 33, 64, 95, 114)?

The four occupations that have been named

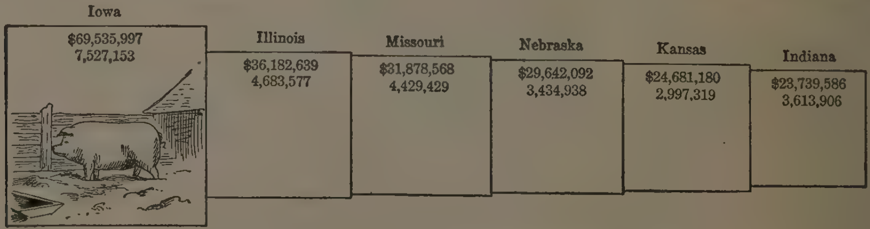

FIG. 197. — The six leading hog-producing states (1910).

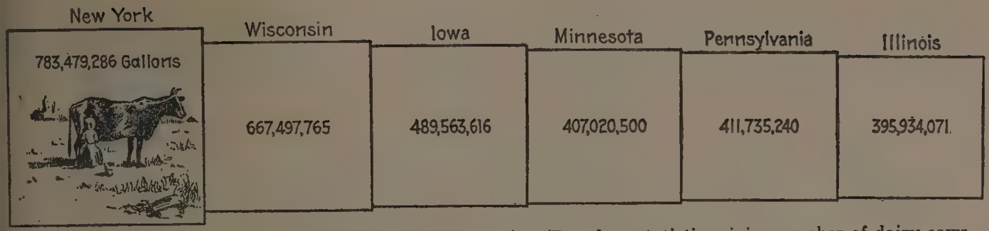

FIG. 198. — The six leading milk-producing states (1910). (Based on statistics giving number of dairy cows and production per cow.)

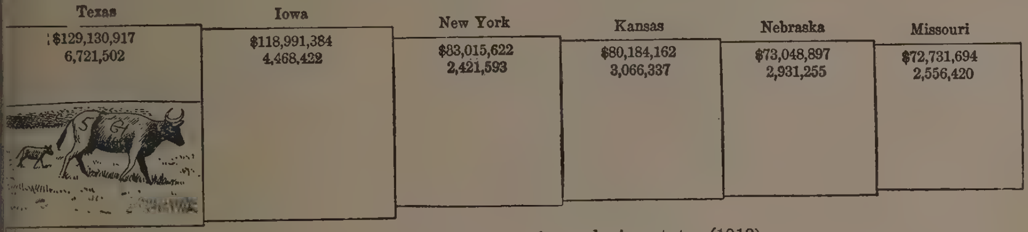

FIG. 199. — The six leading cattle-producing states (1910).

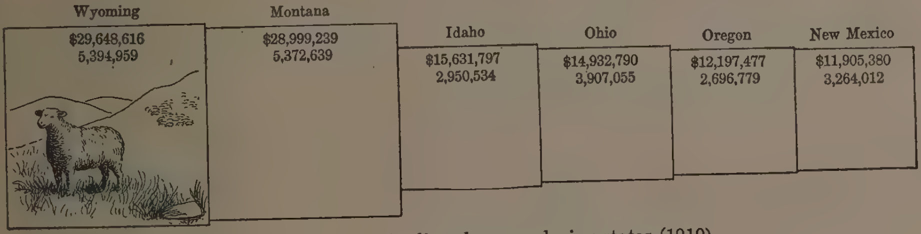

FIG. 200. — The six leading sheep-producing states (1910).

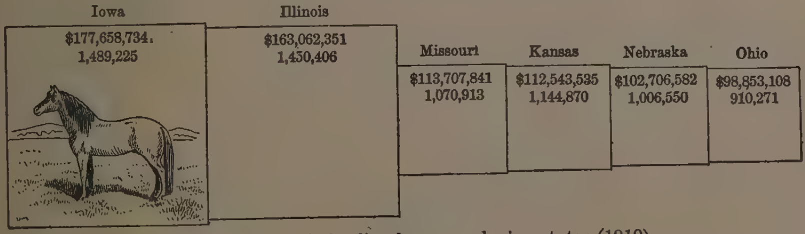

FIG. 201. — The six leading horse-producing states (1910).

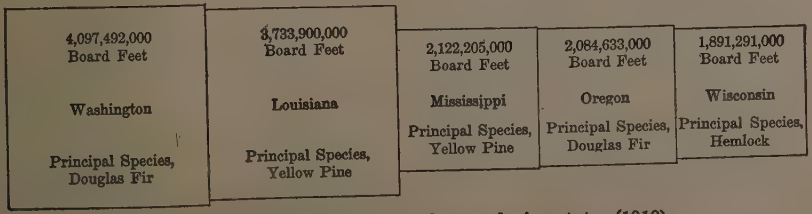

FIG. 202. — The five leading lumber-producing states (1910).

Occupations of country and of city

furnish the *raw materials* for our food, clothing, and shelter. In the main, these four occupations, as stated, lead people to live in small towns or in the country. The three other great occupations require persons engaged in them to live for the most part in cities. These are manufacturing; the transportation of goods; and buying and selling, or trading.

Manufacturing

Figure 210 shows the principal manufacturing sections in the United States. What groups of states do they include? How does it happen that the Northeastern States very early developed cotton manufacturing, although they raise no cotton (p. 36)? What other kinds of manufacturing are important there (p. 36)? Name several of the leading manufacturing centers there, and tell the kinds of work in each. What states lead in textile manufactures (Fig. 211)? Where are the cotton and wool obtained?

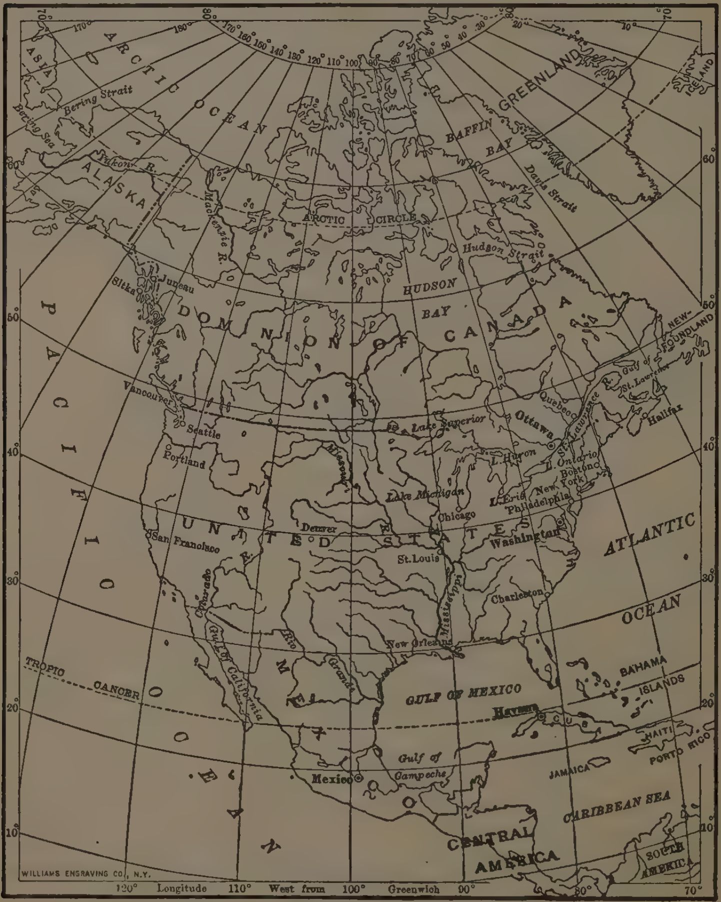

FIG. 203. — Map showing distribution of fish.

What kinds of manufacturing are very important in the Northeastern States, aside from textile goods (pp. 36–40)? What reasons can you give why Pennsylvania leads in iron manufacturing (p. 36)? How are iron and steel made (p. 37)? Name three kinds of iron (p. 37). Make a list of articles manufactured from iron. Name the six leading states in the production of pig iron (Fig. 212). In iron manufacturing (Fig. 213).

Tell about the manufacture of pottery in the Northeastern (p. 37) and in the Central States; about the manufacture of glass (pp. 37, 95); of cement (pp. 38, 95); of bricks (p. 37).

Tell about the advance in manufacturing in the Southern States (p. 65). What great advantage does Birmingham enjoy for the manufacture of iron goods (p. 72)? Name other important kinds of manufacturing in the Southern States (p. 67). What are the leading manufacturing centers there, and for what goods is each important?

Into what goods are corn, wheat, and barley manufactured in the Central States (p. 89)? Name the great centers for the manufacture of flour (p. 97). What can you tell about the manufactures from forest products in the Central States (p. 95)? For what kinds of manufacturing is Chicago important (p. 98)? St. Louis (p. 102)? Cleveland (p. 100)? Kansas City (p. 103)?

How has the abundance of fruits in the Western States led to much manufacturing (p. 88)? Name some flour-manufacturing center in the Far West (p. 124). Name important centers for smelting of ores (p. 123). For what manufactures is San Francisco important (p. 125)? Portland (p. 127)? Seattle (p. 127)?

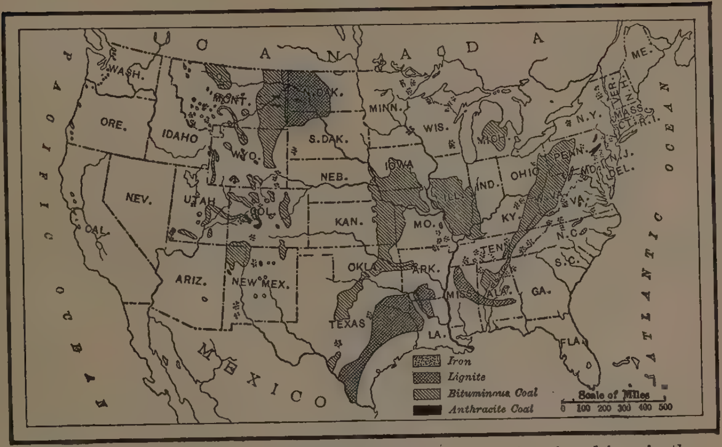

FIG. 204. — Map showing the distribution of deposits of coal and iron in the United States.

Manufacturing employs more workmen in the United States than any other industry, except agriculture. More than seven million men are engaged in it.

The six wealthiest states are shown in Figure 214. Note that all these states are extensively engaged in manufacturing, as shown in Figure 210.

Transportation of goods

1. By water

The importance of being able to ship goods by water is clearly shown by the fact that most of our twenty-five largest cities (See Appendix, p. 392) are situated on a water route of some kind. Name the leading harbors along the Atlantic and Gulf coasts. Name those on the Pacific coast (pp. 125–127). Our seven leading ocean ports, in the order of their importance, are New York, New Orleans, Galveston, Boston, Philadelphia, Baltimore, San Francisco. Locate each.

What can you say about the importance of the Great Lakes for shipment of goods? How are these lakes connected by water with the ocean (p. 96)? By examining Figure

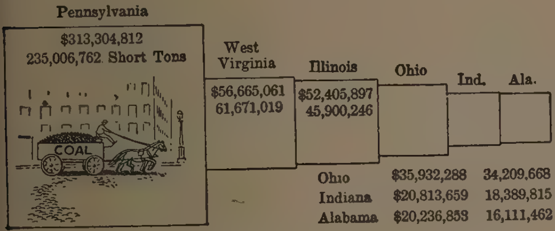

FIG. 205. — The six leading coal-producing states (1910).

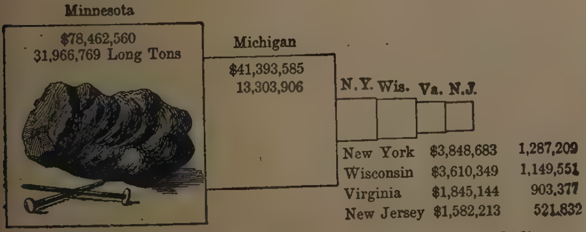

FIG. 206. — The six leading iron-producing states (1910).

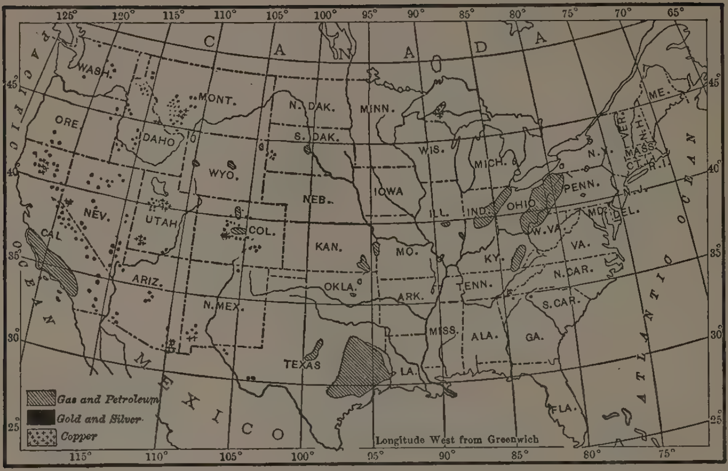

FIG. 207. — Mineral regions of the United States.

215, name the principal navigable rivers in our country.

The Great Lakes carry about twice as much freight as the Mississippi system. Mention some of the principal kinds carried on each.

Where is the Erie Canal? Why has it been so important? Why has it become of less importance than formerly? Where else are canals found (pp. 96 and 141)?

2. By rail Figure 216 shows an enormous number of railways in the United States. They now carry fully three times as much freight as all the water routes together. In what part of the country are most of them found? Why there? Which section is next best supplied with them? Which portion has fewest lines? How does the location of railway lines on this figure compare with the location of cities on Figure 185?

What about the *direction* of a majority of the railway lines? Count the number of railways that extend east and west across the western half of the continent (Fig. 217). In what city on the Pacific coast does each of the transcontinental lines terminate?

The number of miles of railroad that each section of states has, in proportion to its area, is shown in Figure 218. The names of the

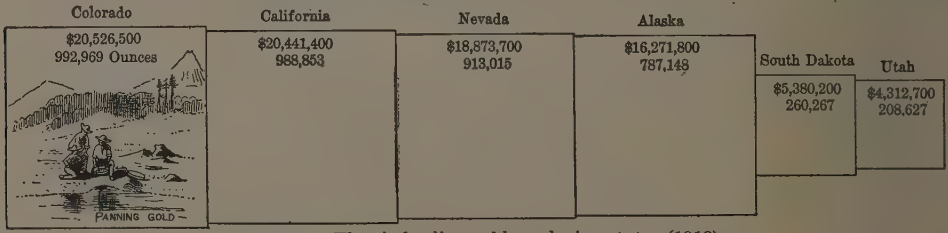

FIG. 208. — The six leading gold-producing states (1910).

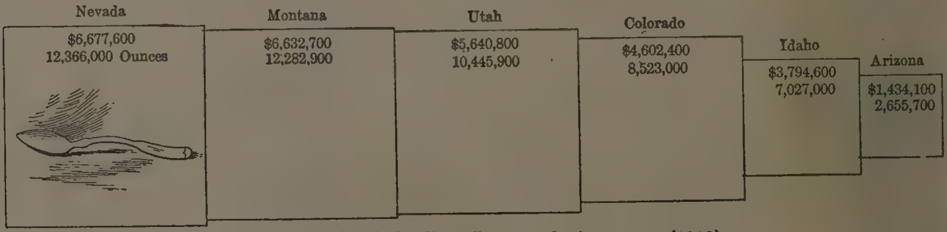

FIG. 209. — The six leading silver-producing states (1910).

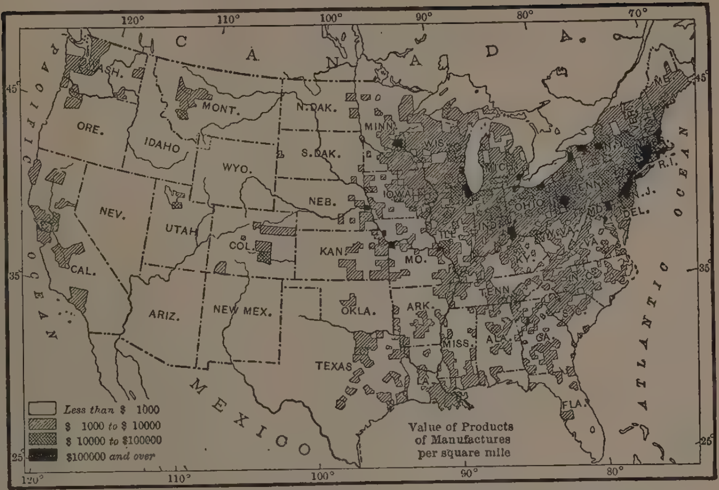

FIG. 210. — Map showing the leading manufacturing districts in the United States.

principal railroads in the East are shown in Figure 216. Note how the roads come together at the great centers of manufacturing and commerce.

Buying and selling, or trade

Trade is the third occupation that attracts great numbers of people to cities. Every one knows that it is important to have stores scattered about over the country, in towns and villages, where one can purchase the articles that he needs from day to day.

But there could not well be such stores unless there were great centers of trade where the storekeepers themselves could buy the goods that they wished later to sell.

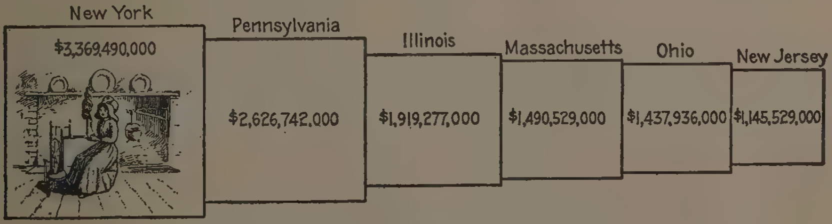

FIG. 211. — The six leading manufacturing states (1910).

This is called *wholesale trade*, and is one of the leading occupations in the great cities.

The greatest center for the wholesale trade in our country is New York City. Describe that business there (p. 43). What goods are sold? Name other great centers for wholesale trade, and some of the goods that are sold. What goods are extensively sold in New Orleans? Memphis? Baltimore? Indianapolis? Denver?

Fully four million persons in the United States are engaged in transportation of goods and in trade, or in *commerce*, as these two kinds of business together are called.

Dependence of country and city upon each other

The relation between country and city is now clear. About one half of our men are engaged in obtaining raw materials through

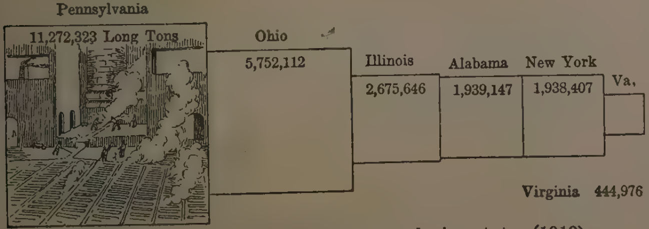

FIG. 212. — The six leading pig-iron-producing states (1910).

agriculture, lumbering, fishing, and mining. The remainder are mainly employed in manufacturing these raw materials into useful articles, or in buying, selling, and transporting them. Show by numerous examples how neither class can well do without the other.

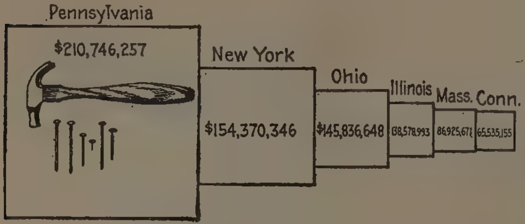

FIG. 213.—The six states leading in iron manufacturing (1910).

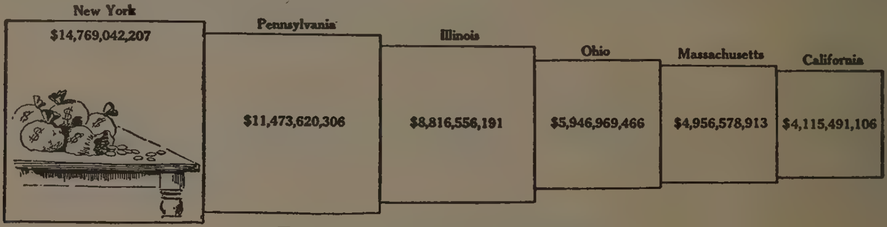

FIG. 214.—The six wealthiest states.

Differences in manner of life

Although the two classes are so dependent on each other, the life of one is very different from that of the other. Recall farm life as described on page 85. What idea have you formed of farm life on Southern plantations? Of the ranchman's life (p. 90)? Of the miner's manner of living? The lumberman's? The fisherman's? The farmer's?

Recall, on the other hand, what was said about life in New York City (p. 43). Give your idea of factory life; of life in trade and transportation. Which of these several occupations do you consider most attractive? Which least attractive?

It is difficult to say which occupation requires the hardest work, for success demands one's best effort, no matter what the occupation may be. But which are more sure of simple food, clothing, and shelter, those living in the city or those in the country? Why? Which are more independent in general? Why? Which have the better opportunities for amusement? Why? For education? Why? For homes with plenty of light and fresh air? Why?

For many years the population of cities

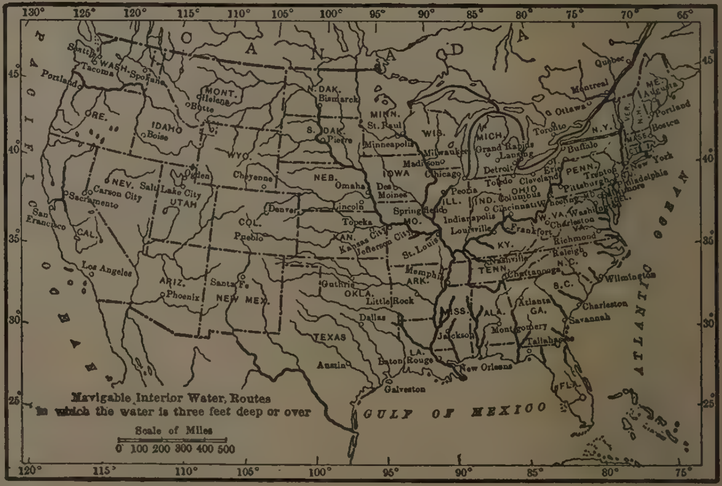

FIG. 215.—Map to show the navigable interior water routes of the United States.

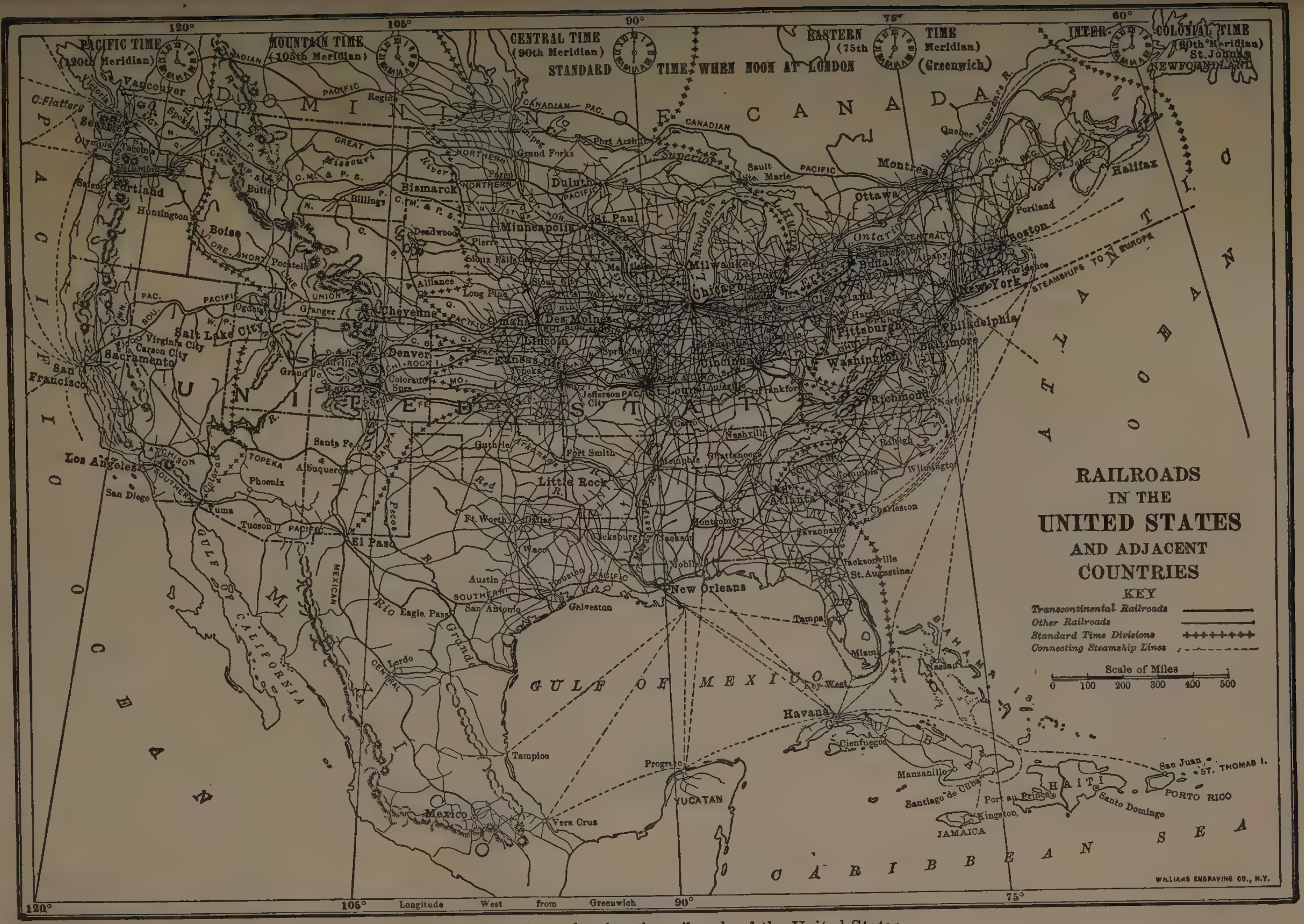

FIG. 216. — Map showing the railroads of the United States.

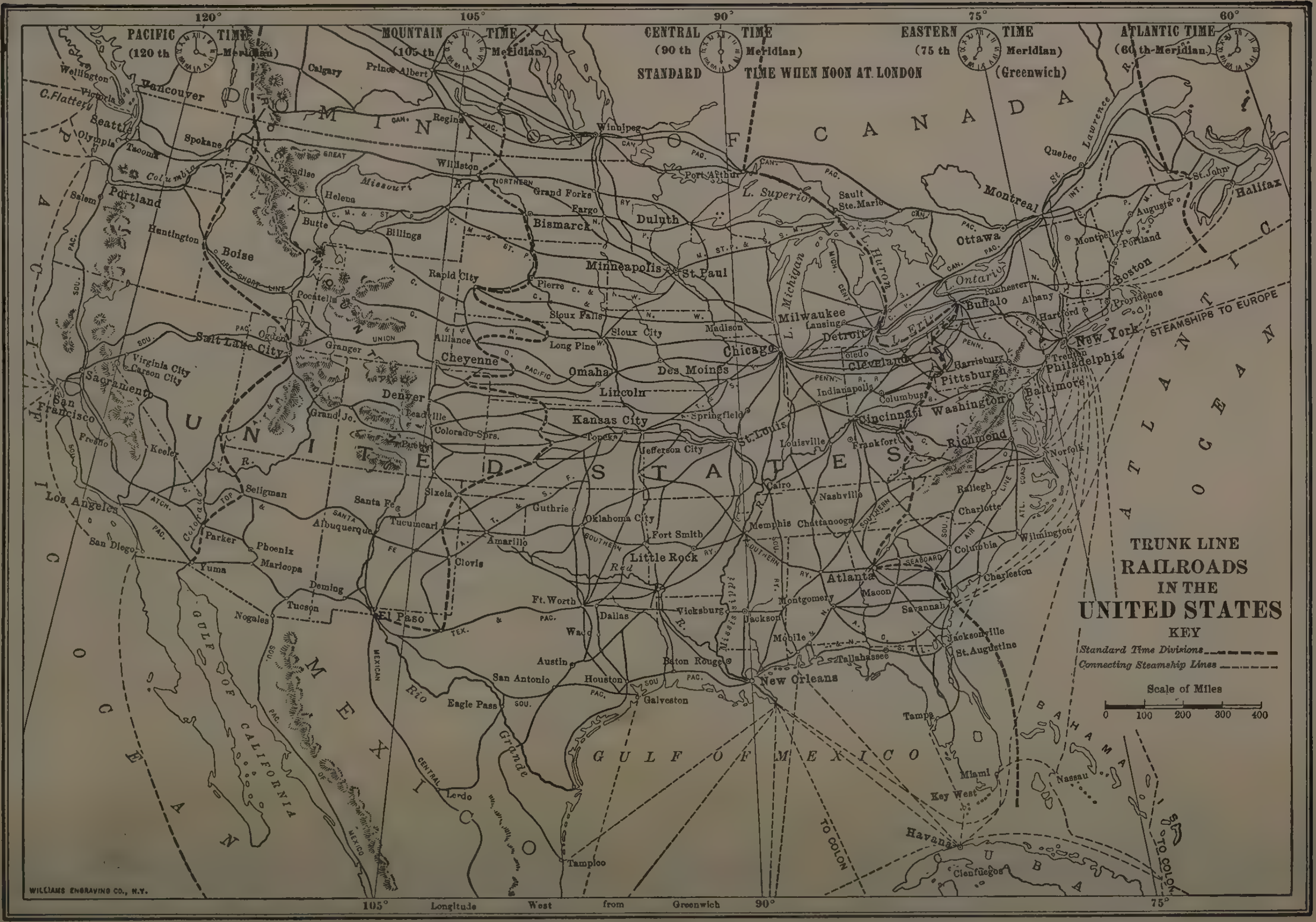
TRUNK LINE
RAILROADS
IN THE
UNITED STATES
KEY
Standard Time Divisions
Connecting Steamship Lines
Scale of Miles
0 100 200 300 400
PACIFIC TIME (120 th Meridian)
MOUNTAIN TIME (105 th Meridian)
CENTRAL TIME (90 th Meridian)
EASTERN TIME (75 th Meridian)
ATLANTIC TIME (60 th Meridian)
STANDARD TIME WHEN NOON AT LONDON (Greenwich)
120°
105°
90°
75°
60°
105° Longitude West from Greenwich 90°
75°
DOMINION OF CANADA
UNITED STATES
ATLANTIC OCEAN
PACIFIC OCEAN
GULF OF MEXICO
MEXICO
GULF OF CALIFORNIA
BAHAMA IS.
CUBA
STEAMSHIPS TO EUROPE
TO COLON
TO COLON
Vancouver
Seattle
Tacoma
Portland
Spokane
Boise
Salt Lake City
Sacramento
San Francisco
Los Angeles
San Diego
Denver
Cheyenne
El Paso
Winnipeg
Minneapolis
St. Paul
Duluth
Chicago
Omaha
Kansas City
St. Louis
Milwaukee
Detroit
Cleveland
Buffalo
Pittsburgh
Cincinnati
Washington
Baltimore
Philadelphia
New York
Boston
Montreal
Ottawa
Quebec
Halifax
Richmond
Atlanta
New Orleans
Memphis
Little Rock
Ft. Worth
Dallas
Houston
Galveston
San Antonio
Havana
WILLIAMS ENGRAVING CO., N.Y.

FIG. 217.

has been increasing more rapidly than that of the country, which suggests that people prefer city to country life. Can you give any reasons for this, in addition to those already mentioned?

Dependence of different sections upon one another

No one place produces all the materials needed there. Which of your foods are not raised near your home? How about the knives, forks, dishes, and spoons? How about the clothes that you wear?

Because of the climate, water power, soil, or for some other reason, each part of the country is especially fitted for producing one or several things; for instance, eastern Kansas for grain, western Kansas for stock, northern Maine for lumber, etc. Indeed, most of the articles used in each part of the country must be brought from other places.

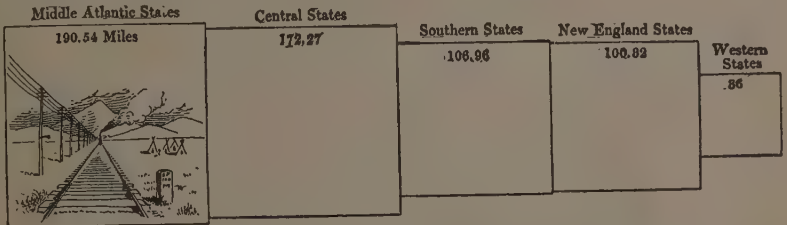

Fig. 218.—The figures represent the number of miles of railway for every one hundred square miles of territory in each of the five groups of states (1910).

Name the materials that the Montana ranchman needs from the Southern planter; from New England; from Minneapolis and Chicago. Upon what parts of the United States are the inhabitants of Florida dependent? What do they supply in return? Make a list of the materials used in the building of your house; and, as far as possible, determine where each one may have come from.

From these facts it is plain that the different parts of the country are of vital importance to one another, much as different parts of the body are.

Our relation to our dependencies

In spite of our broad territory, and the enormous number of our products, there are some necessary articles that are either entirely lacking, or cannot be produced in sufficient quantities within our own borders. Name a few. (See Table of Imports.) Mention some that we are therefore glad to receive from Alaska; Cuba; Porto Rico; the Hawaiian Islands; the Philippines. Mention others that they, likewise, are glad to receive from us. State, then, how the United States and its dependencies are of advantage to each other.

2. Other Countries of North America

Canada and Newfoundland

The principal industries in southern Canada and Newfoundland are similar to those in our Northern States. What about agriculture there (p. 151)? Where is coal mined (p. 153)? Precious metal (p. 153)? What about ranching (p. 151)? Lumbering (p. 151)? Fishing (p. 151)? Compare the raw products of southern Canada with those of our Northern States. Name and locate the principal cities; the leading trade route. Mention the chief kinds of manufacturing. (For above, see p. 152.)

Mexico

Describe the surface of Mexico (p. 159). The climate (p. 159). What are the agricultural products from its arid plateaus (p. 160)? From its lowlands (p. 161)? From the slopes between (p. 161)? Tell about the forests of Mexico (p. 159); the mining (p. 162). Give some reasons why there is so little manufacturing in that country (p. 162). Locate the principal cities.

Name the six republics of Central America. Describe the surface of the country and the

Central America and West Indies

climate (p. 164). Name the principal industries (p. 164). Tell about the canal across the isthmus (p. 141).

Mention the largest islands among the West Indies. What are their chief industries (p. 165)?

3. Relation of United States to Other Countries

Need of our sending away some goods and receiving others

What industries in the United States are not found, or are little developed, in Canada? In Mexico? In Central America? What industries in any one of the latter countries are not found in the United States?

As in the case of any single locality, the United States as a whole produces far more of some materials than our people can consume. Other important articles must come wholly, or in part, from abroad. Give examples of each.

If we could not secure a market for our products in foreign lands, we should suffer greatly; and if foreign countries did not provide us with what we need, we should suffer again. Other countries are in the same condition. Show how that is true of Canada; of Mexico. There is excellent reason, therefore, for a constant exchange of goods among the nations of the world. How does the size of our country give us a great advantage in this respect?

The names of such goods, and their value

The goods that we send forth are called *exports*, and those brought in, *imports*. Examine the tables of exports and imports on pages 386 and 387 to see some things that we send away and receive, as well as the countries with which we trade.

More than half of all our exports and imports are sent by way of New York. Why? Other ports next in importance have already been named (p. 175).

4. Value of Steam and Electricity in Development of North America

Advances made in a century

The use of steam upon the waterways and railways has been of the greatest influence in the development of our country. A century ago it required two days to travel from New York to Philadelphia, and six days from New York to Boston. In the latter case only two trips per week were made by stage. The journeys were not only very tiresome, but were often dangerous.

At that time there were but thirteen daily papers in the United States, and neither papers nor books could be sent by mail. Letters cost from six to twenty-five cents, according to the distance; and because the expense of carrying them was great, they were not sent from the smaller towns until a sufficient number were collected to make it worth while.

Now we can travel as far in an hour as our forefathers could in a day, and with much more comfort. There are over two thousand daily papers, and these, as well as letters, may be sent quickly and cheaply to every section of the country. We can send a telegram to a distant point in an instant, and can talk by telephone with a person hundreds of miles away, even recognizing the tones of his voice. How wonderful these facts would have been to persons living a hundred years ago!

Influence of these advances on our mode of life

The effect of such a mighty change is seen in every direction. Each year thousands of car loads of fruit are shipped to Eastern cities from California. If there were no railways, how could such fruits reach these cities? What, then, would be the effect on Southern California? Also, how could the corn of the Central States be marketed? And how could furniture, sugar, and coffee be brought to the Western farmer's door? Trace other results of this change.

If our railway trains and steamboats should all suddenly stop running, there would be a famine in every large city within a few days. Even now, when heavy falls of snow block the trains for a day or two, the supply of milk, meat, and other foods quickly runs low, and the prices rise to several times their usual value.

If we had no railway trains, there might also be extensive famines over large areas of country, as there were in Europe in the olden times, and as there are even at present in China. Why in China? As it is, however, hundreds of articles of food and clothing are quickly brought from distant points. Mention several such articles. No one section is in danger of suffering from want of food, because if the supply fails there, it is easily obtained from other sections.

The effect of steam and electricity on the industries and inhabitants of cities is striking. Many persons living scores of miles away do much of their shopping in the cities. Owing to trolley lines, elevated railways, and other means of rapid travel, those engaged in manufacture or commerce are able to live many miles from their places of work, and thus secure more healthful homes in the suburbs. Because so many people are able to have their homes in the suburbs, the cities are not nearly so overcrowded as they might otherwise be.

Their influence on government

When our Union was formed, more than a century ago, many wise persons believed that it was bound to be a failure. Our population was so scattered (Fig. 21) that people living in one part were likely to know and care little about those in other distant parts. It seemed probable that quarrels and wars would arise, due to differences of opinion, and therefore that our republic might be split into several rival countries.

Just the opposite has happened. Our people are closely united in interests, and are working well together. At the same time our boundaries have been so enlarged as to include far more territory than was at first thought possible (Fig. 219).

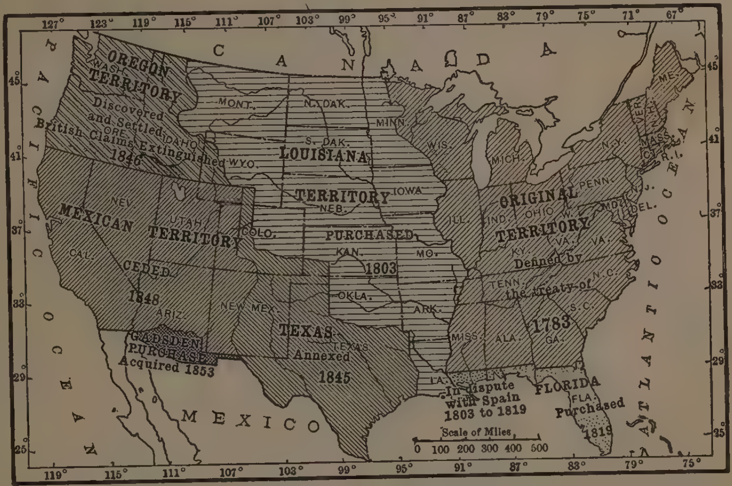

Fig. 219. — Map to show when and how the United States obtained its territory.

Aside from that, millions of foreigners have settled in our country since 1821, representing all the principal races of mankind (Appendix, p. 398), and many of the leading languages, religions, and political beliefs of the world. In spite of all this, we have kept in such close touch with one another that our Union has grown stronger and stronger.

Each day, by rail and water, articles are sent to all parts of the country. In all the states the people read the same news every morning; and whatever books are found especially valuable in one section quickly become known in others. Thus we not only enjoy far better opportunities for education than formerly, but we learn to *know* one another; we have the same thoughts, and we feel a common sympathy. So far as meeting and understanding one another are concerned, our country is really far smaller than it was a hundred years ago; we are living together like one very large family.

The governments of Canada and Mexico are unions of many states, much like our Union; and the benefits that they have received from steam and electricity have been similar to our own.

Review of locations and suggestions

The review of locations should include the principal mountain ranges and famous mountain peaks; several well-known capes; the more important islands; the principal bays, sounds, and gulfs; about twenty-five rivers; twelve or more lakes; the states of the United States, the provinces of Canada, and the countries of Central America; and at least one hundred cities.

1. *Cities.* The cities whose location should be reviewed may be divided into two classes: (1) those about which the pupil should know considerably more than the location — at least the general features, including the principal cities of the United States, the home state, and the section; and (2) those whose location should be known, but about which only one or two distinguishing facts need be learned besides. The two classes are separated in the list that follows, which is merely suggestive.

(1) Atlanta, Baltimore, Birmingham, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Galveston, Indianapolis, Kansas City, Los Angeles, Louisville, Memphis, Mexico, Milwaukee, Minneapolis, Montreal, Newark, New Orleans, New York, Omaha, Philadelphia, Pittsburgh, Portland, Providence, Quebec, Richmond, St. Louis, St. Paul, Salt Lake City, San Francisco, Seattle, Toronto, Vancouver, Washington, Winnipeg.

In the first group of cities, all the principal cities of the state should be included.

(2) Albany, Allentown, Altoona, Bayonne, Binghamton, Bridgeport, Brockton, Butte, Cambridge, Camden, Charleston (S.C.), Chattanooga, Columbus (O.), Dallas, Dayton, Des Moines, Duluth, Elizabeth, Evansville, Fall River, Fort Wayne, Fort Worth, Grand Rapids, Halifax, Harrisburg, Hartford, Havana, Hoboken, Holyoke, Honolulu, Houston, Jacksonville, Jersey City, Johnstown, Juneau, Kansas City (Kan.), Key West, Knoxville, Lancaster, Lawrence, Lincoln, Lowell, Lynn, Macon, Manchester, Mobile, Montgomery, Nashville, New Bedford, New Haven, Nome, Norfolk, Oakland, Oklahoma City, Ottawa, Panama, Paterson, Peoria, Portland (Me.), Pueblo, Reading, Rochester, Sacramento, St. Joseph, San Antonio, San Diego, Savannah, Scranton, South Bend, Spokane, Springfield (Mass.), Syracuse, Tacoma, Tampa, Terre Haute, Toledo, Trenton, Troy, Utica, Waterbury, Wheeling, Wilkes-Barre, Wilmington (Del.), Wilmington (N.C.), Vera Cruz.

In this second group of cities, there should be included the cities and towns about which people should be informed in order to read the news of the important events of the day intelligently.

2. *Mountains.* Rocky Mountains, Cascade Range, Sierra Nevada, Appalachian Mountains, Allegheny Mountains, Blue Ridge, Adirondacks, Catskills, White Mountains, Ozarks, Sierra Madre, Mt. McKinley, Mt. Rainier, Mt. Hood, Mt. Shasta, Mt. Whitney, Pikes Peak, Mt. Mitchell, Popocatepetl.

3. *Capes.* Cape Flattery, Cape Mendocino, Cape Sable, Cape Hatteras, Cape May, Cape Cod, Cape Race.

4. *Islands.* Greenland, Iceland, Newfoundland, Long Island, Bermudas, Bahamas, Cuba, Haiti, Santo Domingo, Porto Rico, Jamaica, Vancouver Island.

5. *Peninsulas.* Nova Scotia, Florida, Yucatan, Lower California.

6. *Bays, Straits, and Gulfs.* Baffin Bay, Davis Strait, Hudson Bay, James Bay, Gulf of St. Lawrence, New York Bay, Delaware Bay, Chesapeake Bay, Gulf of Mexico, Caribbean Sea, Gulf of California, San Francisco Bay, Puget Sound, Bering Sea, Bering Strait.

7. *Lakes.* Lake Winnipeg, Lake Superior, Lake Huron, Lake Michigan, Lake Erie, Lake Ontario, Lake Champlain, Great Salt Lake, Lake Pontchartrain, Lake Nicaragua.

8. *Rivers.* Mackenzie, Yukon, Fraser, Columbia, Snake, Colorado, Rio Grande, Mississippi, Missouri, Platte, Arkansas, Ohio, Tennessee, Niagara, James, Potomac, Susquehanna, Delaware, Hudson, Connecticut, St. Lawrence, Red, Saskatchewan, Nelson.

PART II. GENERAL GEOGRAPHY

I. THE EARTH

Form and size of the earth

THE earth is a sphere with a circumference of about twenty-five thousand miles, and a diameter of nearly eight thousand miles. It is slightly flattened at the poles, however. For this reason, the line which extends through the center of the earth from pole to pole — called the *earth's axis* — is a little shorter than the diameter at the equator.

Proofs that it is round

The earth is known to be round like a ball, not only because people have traveled around it, but also because its shadow, as seen in an eclipse, is always round. A sphere is the only body that will always cast a round shadow.

Its daily motion, and the results

The earth is rapidly turning, or rotating, about its *axis*. This motion has very important results. In the first place it causes sunrise and sunset. When we glance out of the window of a moving car, the objects that we pass often appear to be moving in the direction opposite from that in which we are traveling. It seems as though we were standing still. In a similar way the rotation of the earth causes the sun to *appear* to move; to appear to rise and set. Indeed, for a long time people believed that it was the sun that moved, and not the earth.

Since we first see the sun in the east, it is plain that the earth is rotating eastward; that is, from west to east. This rotation gives us the light of the sun for a few hours, and then brings darkness. Thus it causes day and night. And since one rotation lasts twenty-four hours, it gives us a day of that length.

By rotating a globe, or an apple, in the sunlight, show how day and night are caused on the earth. Hold the sphere still. What would be true about daylight and darkness on the earth if it did not rotate at all? What might be the effect upon life on the earth if the same side were always toward the sun?

The yearly motion of the earth

The earth has another motion that is of very great importance. This is its *revolution* around the sun, which is illustrated in Figure 220. The object shown in the center of the circle is the sun, as you see, and the circle itself shows the course that the earth takes in its revolution.

At the same time that the earth is whirling on its axis, it is also forever swinging around the sun, although the sun is ninety-three million miles from it. It takes a year to complete one revolution. Indeed, the time necessary for this great journey is what fixes the length of our year. The path, or *orbit*, that the earth takes is here represented as a circle, although, in fact, the earth's path is not a perfect circle.

Importance of the forces called gravity and gravitation

In its revolution, the earth is moving at the rate of more than one and a half million miles per day. What fearful speed! And this, too, while it is whirling, or rotating, on its axis! One might ask, "With such rapid motion, why are we not swept from the earth by the wind?" The answer is that the air, as well as everything else upon the earth, is drawn toward the earth and held in place by the force called *gravity*. It is on account of this force that everything on the earth turns with it, in the daily rotation, and swings around with it in its annual revolution.

Again, if the earth is revolving at such speed, why does *it* not fly away into space? As a stone swinging round at the end of a string flies off when the string breaks, so it might seem that the earth would fly off into space; for there *appears* to be nothing holding it to the sun.

As a matter of fact, there *is* something holding it. It is not a string, nor a rope, to be sure, but something far stronger. The sun is very much larger than the earth; in fact, it is over a million times as large. It attracts the earth, and holds it in place, in much the same way as the force of gravity attracts men and houses to the earth. This *attraction of gravitation*, which the sun exerts upon the earth, is what prevents our sphere from flying off into space; it holds the earth as firmly as the string holds the stone.

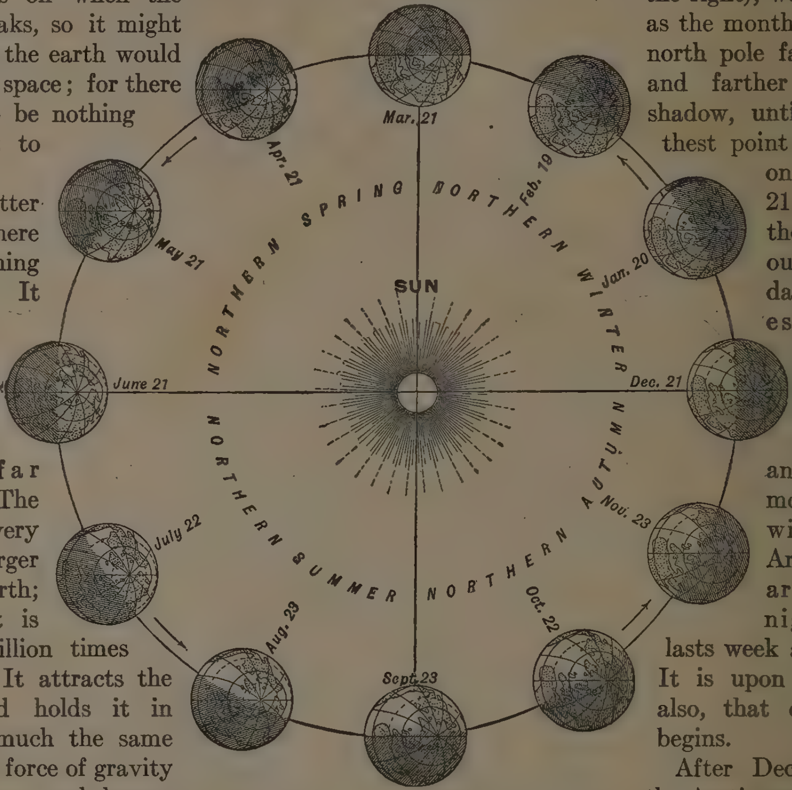

Fig. 220.—To illustrate the revolution of the earth around the sun. The shaded portion represents night. The end of the axis around which the earth rotates is the point where the lines come together.

The revolution of the earth is what causes our seasons and the changing length of our day and night.

Effects of the earth's revolution

In Figure 220 the lowest sphere, bearing the date September 23, represents the earth as receiving the light of the sun from pole to pole. On that date day and night are equal everywhere upon the earth. It marks the end of summer and the beginning of our autumn.

Following the earth in its revolution (to the right), we find that, as the months pass, the north pole falls farther and farther into the shadow, until the farthest point is reached on December 21. That is the date for our shortest day and longest night. Farther north the nights are longer still, and the Eskimos, who live within the Arctic Circle, are having night that lasts week after week. It is upon this date, also, that our winter begins.

After December 21, the Arctic region gradually comes into the light once more, until, on March 21, the sun's light again extends from pole to pole. Day and night are once more equal everywhere upon the earth, and warmer weather returns. That date marks the beginning of our spring.

Going farther, on June 21, the north pole is shown to be just as far within the light as it was within the shadow on December 21. This is the date for our longest day and shortest night. Farther north, the days are

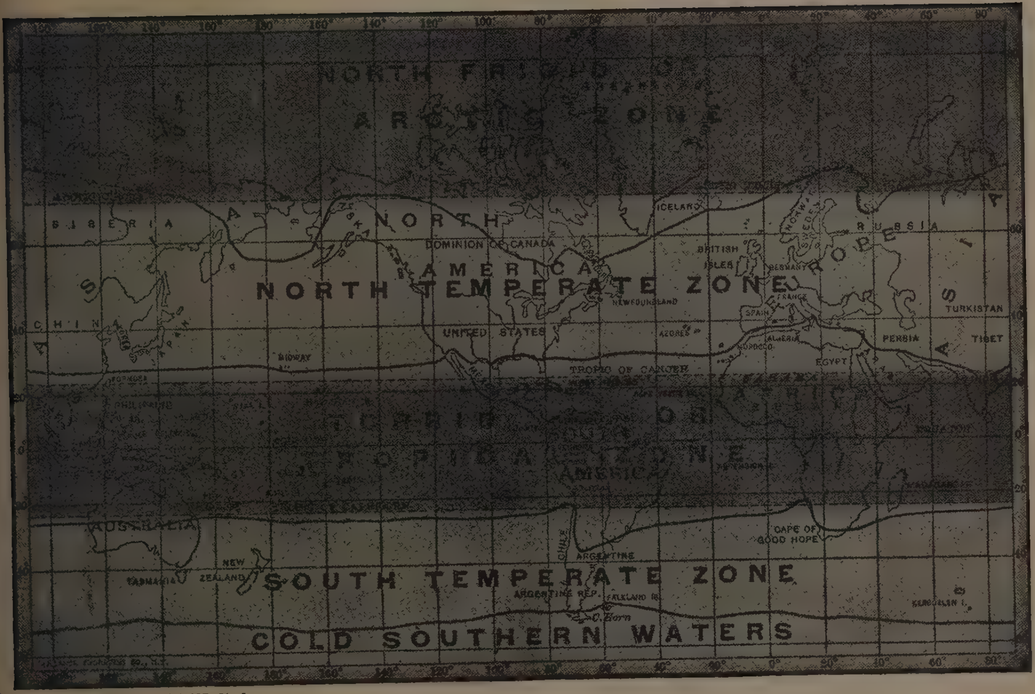

Fig. 221. — A map of the zones.

longer still, and within the Arctic Circle the days last week after week. It is upon this day, also, that our summer begins.[1]

After this date, until September 23, the continued revolution of the earth gradually brings the north pole again toward the shadow. Then, on September 23, the light of the sun once more extends from pole to pole, so that day and night are again equal, and a year is completed.

Thus the seasons follow one another, and our days and nights constantly change in length. And it is all because, as the earth revolves about the sun, the part of the earth that receives the sun's rays is continually changing.

Cause of the zones, and their boundaries

Figure 221 shows the zones on the earth. How many are there? Name and locate each. The cause of the zones is found in the slant at which the rays of the sun strike the earth. In the torrid zone they are always either vertical, or nearly so. In the temperate zone, they strike the earth at a greater slant; and in the frigid zones at a much greater slant still. On this account, the heat grows less and less as one approaches either of the poles.

The boundaries of the *tropical* (*torrid*) *zone* are easily fixed, because they mark the points farthest north and south where the sun's rays are vertical at some period of the year. On December 21, when the north pole is farthest within the shadow (Fig. 220), the sun's rays are vertical as far south as the

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[1] Some teachers may wish to introduce here an explanation of the effects of inclination of the earth's axis, and a more complete study of the seasons. This has not been included in this book because it is felt that, unless the teacher has the necessary apparatus, a mere study from the text is too difficult. The authors believe that it is a subject that is better fitted for the high school age.

Tropic of Capricorn. On June 21, on the other hand, when the north pole is farthest within the light, the sun's rays are vertical as far north as the Tropic of Cancer.

The *north frigid* (Arctic) *zone* is the region around the north pole that lies entirely in darkness on December 21. On June 21, this same region lies entirely in the light. The *south frigid zone* is the corresponding region about the south pole.

The two *temperate zones* are merely the wide belts that lie between the torrid zone, on the one hand, and the frigid zones on the other. There is one, called the *north temperate zone,* in the northern hemisphere, and another, called the *south temperate zone,* in the southern hemisphere.

Name the boundaries of each of the zones. It is convenient to use such boundaries; but there is really no sharp difference on the two sides of any one of them. Indeed, the real boundaries are quite irregular (Fig. 221); for in some parts of the temperate zone there is a very hot climate; and on the highlands of the tropical zone, the climate is often temperate, or even frigid. These are exceptions, however, and generally the climate is torrid in the tropical zone, temperate to the north and south of it, and frigid around the poles.

How the earth's revolution causes our seasons

Our seasons are likewise due to the slant at which the sun's rays strike the earth at different times of the year. On December 21, the midday sun is low in the heavens, in the region where we live, and then its rays reach us at the greatest slant. That, then, marks the beginning of our coldest season. On June 21, on the other hand, the midday sun is high in the heavens, and the rays are then most nearly vertical. That, then, marks the beginning of our warmest season. Spring comes as the rays become more nearly vertical; and autumn as they grow less so.

How the revolution affects our daily lives

The revolution of the earth around the sun is, therefore, of the greatest importance. It causes our seasons by continually changing the slant at which the sun's rays fall upon us. That affects us in a thousand ways. It determines, for instance, the time when our lamps shall be lighted, when crops shall be planted and harvested, and when the navigation of many of our rivers and lakes shall be opened and closed. It even leads to changes in the kind of clothes that we wear, and greatly influences the sports that we enjoy. Name some of its other influences.

Review Questions

1. State the form and size of the earth. 2. Give proofs that it is round. 3. Tell what you can about its daily motion, and the results. 4. What is its yearly motion? 5. How are gravity and gravitation important forces? 6. State the effects of the earth's revolution. 7. State the cause of the zones. 8. Of their boundaries. 9. How does the earth's revolution cause our seasons? 10. How, then, does this revolution influence our daily lives?

Suggestions

1. Show by a globe, or a ball, how the two movements of the earth, rotation and revolution, can be going on at the same time. 2. Are the days growing longer or shorter at present? 3. During which months do they grow longer? During which months shorter? 4. At what time of day does your shadow always point directly north? 5. Notice how your shadow changes with the season in early morning; at noon; in the evening. 6. Tell about the direction and length of a man's shadow at noon on December 21 at various points between the poles. 7. On June 21. 8. On September 23. 9. How long is our longest night? Our shortest? 10. Which zone has the slightest change of seasons? Why? 11. Is it once or twice each year that the vertical rays of the sun fall upon any one place in the torrid zone?

II. Latitude, Longitude, and Standard Time

1. Latitude and Longitude

Need of some way of locating places exactly

In a study of geography, it is often necessary to locate places exactly. This is not so easy as it might seem. For instance, suppose we wish to state where London is situated; how would it be done? Of course, by taking a long time, it would be possible to describe the general location of this city; but some more accurate way should be found.

How houses are located in cities

The difficulty is much the same as that which arises in locating a place in a large city, where there are thousands of houses. No one person knows who lives in most of them, and if a stranger were looking for a friend, he might have much trouble in finding his house.

A very simple means has been found for locating city houses. For example, a street running east and west may be selected to divide the city into two parts, as Washington Avenue does in Figure 222. Any place north of this street is spoken of as being on the *north side;* any place south of it as being on the *south side.* The streets to the north of this central street are numbered as North 1st, North 2d, North 3d, etc.; those to the south of it as South 1st, South 2d, South 3d, and so on. Then if a man says that he lives on North 4th Street, we know at once that he lives on the north side, and that his house is on the fourth street from this central one.

But we need also to know on what *part* of North 4th Street this house is to be found. To answer that question, another street running north and south, and crossing the east and west ones, may be selected to divide the city into east and west parts. In Figure 222, Jefferson Avenue is such a street. The street on the two sides of it are numbered as East 1st, East 2d, West 1st, West 2d, etc. (Fig. 222).

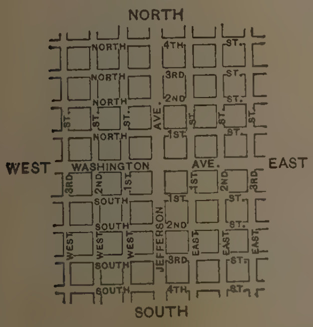


FIG. 222. — Map of a part of a city, to illustrate the need of naming streets.

Then if a man lives on the corner of North 4th and East 3d streets, we know not only that his home is *north* of a certain line, but *east* of a certain other line. If the *blocks,* as the spaces between two streets are called, are always the same, it will be easy to tell the distance from each of the central streets to the house. Thus the house can be located *exactly.*

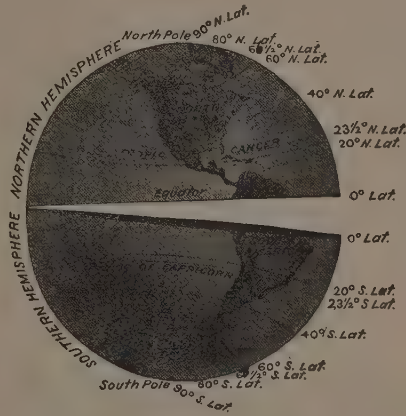


FIG. 223. — The globe, showing the two hemispheres and some of the circles of latitude.

Such a plan is not necessary in small towns and villages, because the people there know one another, and are able to direct strangers easily. Few, if any, cities follow *exactly* the scheme here given; but all have a plan somewhat similar to this. If you live in a city, perhaps you can tell just how houses are located there.

How places can be exactly located on the earth

1. How they can be located in a north and south direction

Places upon the earth are located in much the same manner as in the city just described. The *equator,* which extends around the earth midway between the poles, corresponds to the dividing street (Washington Avenue) that runs east and west. The distance between the equator and the poles, on either side, is divided into ninety parts (Fig. 223), corresponding, we might say, to the blocks in a city. The earth is so large, however, that these "blocks," or parts, are very much larger, each being about sixty-nine miles wide. That distance is called a *degree*, and the sign for degrees is a little circle (°) placed at the right of a figure. (For example, 60° means 60 degrees.)

Lines are drawn upon maps and globes to represent these degrees. The lines on a globe extend completely around it from east to west, and are therefore circles. The first circle north of the equator, marked 1°, is about sixty-nine miles from that dividing line; the one marked 2° is twice that distance, and so on. The north pole is 90° from the equator. The same plan is followed south of the equator; and the south pole is also 90° from the equator. Thus the distance from pole to pole is 180°.

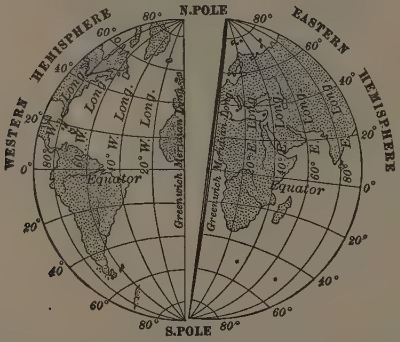


FIG. 224. — The earth, cut in halves along the Greenwich meridian, showing some of the meridians. The meridian 20° is usually considered the dividing line between the eastern and western hemispheres.

All points on any one of these circles are the same distance from the equator, and from each of the other circles. That is, the circles are parallel with one another; and on that account they are called *parallels*.

If one finds that a certain place is on the 8th or the 50th, or some other circle north of the equator, he knows how many miles it is north of that dividing line; for every degree is about 69 miles. San Francisco, for example, is close to the 38th parallel; Chicago is close to the 42d; and St. Paul is on the 45th (Figs. 96 and 123). Knowing this, it is easy to see that Chicago is 4°, or about 276 miles, farther north than San Francisco. It is also easy to see that St. Paul is 3°, or over 200 miles farther north than Chicago.

Thus, by the help of the parallel lines one can find how far any place is north or south of the equator. Instead, however, of saying that places are so many degrees *north or south of the equator*, we usually say that they are in so many degrees *north or south latitude*. San Francisco, for instance, is near 38° *north latitude* (abbreviated *N. Lat.*). Both ways are correct, but the latter is merely the shorter way of saying it. *Latitude is nothing more than distance north or south of the equator, measured in degrees;* and the parallel lines are called *parallels of latitude.*

Of course there are no marks *upon the earth* to show where these circles run. They are drawn *on maps*, where they are of great use because they help to locate places.

Small maps and globes cannot well show the entire ninety parallels on each side of the equator. That would make too many lines. For this reason, only every fifth or tenth parallel is usually put on such maps. Examine some maps (such as Figs. 4 and 96), to see which ones are given. (Near what parallel do you live?)

2. How places can be located in an east and west direction

As in the city, some means must also be found for locating places east and west; for two points might be in 10° north latitude and still be several thousand miles apart. Show that this is so.

Imaginary lines are used for this purpose, as before; but this time they extend around the earth from pole to pole (Fig. 224). These lines, extending through both poles, are called *meridians.*

In a city it makes little difference what north and south street is chosen from which to number the others. It is necessary only that a certain one be *agreed upon.* The same is true of these meridians. No one is especially important, as the equator is, and any one of them *might* be chosen from which to start. Indeed, different nations have selected different circles as the one from which to begin numbering. In France the meridian extending through Paris is chosen; in England that through Greenwich, near London; and in America the one passing through Washington is sometimes used.

It is, however, important that all people agree on some one meridian to start from, so that all maps may be made alike. On that account, many countries begin their numbering with the meridian which passes through Greenwich. The maps in this book follow that plan.

It is necessary in locating places on the earth to study the movements of the sun and the stars; and this is done in a building, called an *observatory*, in which there are telescopes and other instruments. Since there is such an observatory at Greenwich, this seemed to the English people to be a fitting place from which to begin numbering the meridians. Commencing with the meridian of Greenwich, we measure off degrees both east and west of it. On maps and globes these distances are represented by circles extending completely around the earth, through both poles. Thus there is a meridian 1° west, another 2°, a third 3°, etc. Going eastward, the meridians are numbered 1°, 2°, 3°, etc., in the same way. Any place on the 3d meridian *west* of Greenwich is 3° *west* of the principal meridian; if on the 60th meridian, it is 60° west.

Again, however, instead of saying that a place is so many degrees *east or west of the principal meridian*, we say it is in so many degrees *east or west longitude*. This is merely the shorter way of saying it. The place on the third meridian, just mentioned, is, therefore, in 3° west longitude, and the other place is in 60° west longitude. *Longitude is nothing more than distance east or west of the principal meridian, measured in degrees.* The circles that form the meridians are also known as *circles of longitude*.

Any place on the 20th meridian east of Greenwich is in 20° *east longitude* (*E. Long.*). New York is in 74° W. Long., while San Francisco is in about 123° W. Long. Which meridian passes near Chicago? Denver?

The distance around the earth from north to south, through both poles, is four times 90°, or 360° in all. The equator is likewise divided into 360 parts, or degrees. There are therefore 360 meridians, if they are drawn one degree apart. They are numbered up to 180° in both directions (Fig. 225). Thus, 180° E. Long. is the same as 180° W. Long.

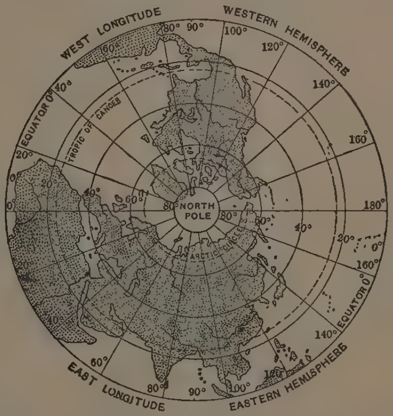


FIG. 225. — A view looking down on the north pole, to show how the meridians come to a point at the north pole. Notice that if the 0° meridian were continued, it would unite with the meridian 180°.

The meridians are not parallel, like the circles of latitude. They are farthest apart at the equator, where the width of a degree of longitude is about 69 miles. But all the meridians come together at the poles, as you can see on a globe or on Figure 225. Therefore the width of a degree of longitude becomes smaller toward the poles.

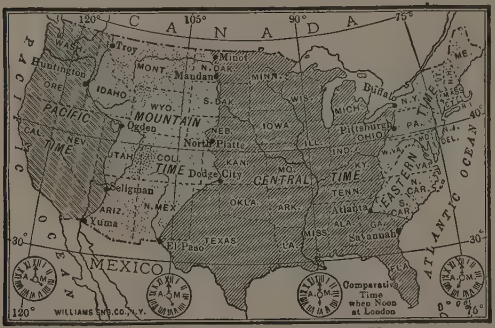
Why and how degrees are divided into smaller parts

On maps showing only a small part of the earth, the circles of latitude and longitude are too far apart to be of much use. It is therefore necessary to have still other circles. For this purpose the degrees are divided into parts, called *minutes*. There are sixty minutes in a degree, as there are sixty minutes in an hour. The minutes themselves are also divided into sixty parts, called *seconds*.

2. Standard Time

The differences in time between places

If you were to travel from New York to San Francisco, you would find on arriving there that your watch was three hours too fast. The reason is that the rotation of the earth is from west to east. This causes the sun's rays to fall upon the Atlantic coast more than three hours earlier than upon the Pacific coast. Hence, when it is noon in New York, it is only about nine o'clock in the morning at San Francisco. The time steadily changes in going either east or west, so that no two places on an east-west line have exactly the same time by the sun.



STANDARD TIME IN THE UNITED STATES

FIG. 226. — To show the Standard Time Belts of the United States.

Formerly every city used its own sun time, or *local time*. This was a source of great trouble to travelers; for their watches were always wrong when they arrived at new places. When railroads were built, and people began to travel more, and to go longer distances, the many different kinds of local time became even a greater inconvenience.

The trouble caused by such differences

How this trouble is now largely avoided

In order to avoid this trouble, our continent has been divided into belts, in each of which the railways, and most of the towns, have agreed to use the same time. Since this time is the *standard for all*, these belts are called the *Standard Time Belts*. The one in the extreme East, including eastern Canada, is called the *Colonial Belt;* the belt next west of this, which includes New England, New York, and some of the other Eastern States, is called the *Eastern Time Belt*. What are the others called (Fig. 226)?

In traveling across the country from New York City to San Francisco, one starts with his watch set at the standard time for the Eastern Time Belt. After a while he comes to a place where the time is changed one full hour; then he sets his watch back an hour in order to have the Central Time. Going still farther west to the Mountain Belt, the watch is again set back one full hour. What is done when the Pacific Belt is reached? By this arrangement, the same time is used over a very broad belt, and only a few changes of the watch have to be made. State how a watch would have to be changed when one goes *eastward* from San Francisco to New York.

How the time for each time belt is fixed

Our study of longitude helps us to understand what determines the places for changing this time. The earth makes one complete rotation every 24 hours, so that the sun passes over 360 degrees in the course of the day of 24 hours. Dividing 360 by 24 gives 15; that is, the number of meridians, one degree apart, that the sun passes over in a single hour. Therefore, when it is noon in a place on the 75th meridian, as at Philadelphia (Fig. 290), it is eleven o'clock just 15° west of this, or on the 90th meridian. When it is noon at one point on a meridian, it is noon all along that meridian.

This explains what has determined the boundary lines of the time belts. The time selected for the Eastern Belt is that of the 75th meridian; for the Central Belt, that of the 90th meridian, which is just one hour later. What meridian is selected for the Mountain Belt (Fig. 290)? For the Pacific Belt?

Each of these meridians runs through the *middle* of the belt whose time it fixes. Thus, the eastern boundary of the Central Time Belt is halfway between the 75th and 90th meridians, that is, 82½° W. Long.; and the western boundary is halfway between the 90th and 104th meridians, or 97½° W. Long.

Review Questions

1. Explain the need of some way of locating places exactly. 2. How may houses be located in large cities? 3. How can all places be located in a north and south direction on the earth? 4. How in an east and west direction? 5. Locate several places accurately by using a map. 6. Define latitude; longitude. 7. What is meant by a degree? 8. How many degrees of longitude are there on the equator? 9. How many miles is each of these degrees? 10. Why are meridians not parallel? 11. How many degrees of latitude are there from pole to pole? 12. How are degrees subdivided? Why? 13. Explain about the differences in time by the sun, in different places. 14. How have these differences caused much trouble? 15. How is the difficulty now largely avoided? 16. Explain how the time for each time belt is determined. 17. Name the time belts in North America, and locate each.

Suggestions

1. Find how the streets of Washington have been numbered and lettered. 2. What is the latitude and longitude of Boston? Of Washington? Of Chicago? Of your home? 3. Find some cities that are on or near the 42d parallel of latitude. 4. What place is in 25° N. Lat. and 81° W. Long.? What place is near 40° N. Lat. and 75° W. Long.? 5. Find places that have nearly the same latitude as your home. 6. Show on a globe, or map, where a ship would be in the Atlantic when in zero latitude and zero longitude. 7. Examine a globe to see what meridian is a continuation of zero longitude on the other side of the earth. 8. Find the latitude of the Tropic of Cancer; of the Tropic of Capricorn; of the Arctic Circle; of the Antarctic Circle. 9. Where and how much should you change your watch in traveling from San Francisco to Chicago? 10. Examine some railway timetables to see how they indicate the changes in time. 11. What is the difference, where you live, between Standard Time and solar or sun time? 12. Find out whether the true Standard Time is telegraphed to your city each day, and if so, from what place.

III. Winds and Rain

1. Winds

The problem before us

In our study of North America, we have learned that the winds of different sections come from different directions. For example, in the West Indies, Central America, and southern Mexico, the winds usually blow from the *northeast;* but on the western side of the continent, all the way from San Francisco to Alaska, the wind blows quite regularly from a *westerly quarter.* In the eastern part of the United States, on the other hand, the winds are irregular in direction, although they blow more often from the west than from any other quarter. We will now study the causes for these differences, and also learn what the principal winds on the earth are.

The currents of air caused by a hot stove

It will help us to understand this subject if we first find what currents of air a hot stove causes in a room (Fig. 227). The first thing that happens when a fire is kindled is that the air near the stove is warmed. This causes it to expand and become lighter. Then the cooler, heavier air in other parts of the room settles down and flows in toward the stove, forcing upward the warm, light air near the stove. This warm, rising air grows cooler as it comes in contact with the cool ceiling and the walls of the room. This makes it dense and heavy again; it then settles toward the floor at some distance from the stove, and once more moves toward the stove.

In other words, the currents of air keep circling around in the room, rising when warmed, and settling when cooled. In such

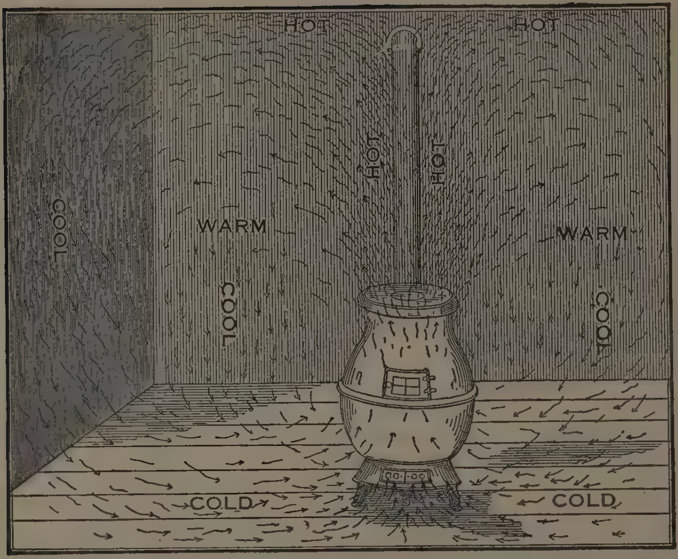


FIG. 227. — The arrows show the currents of air in a room that are caused by a hot stove.

a room, you can easily observe how warm the air is near the ceiling, where it has risen above the stove; and how much cooler it is near the floor at some distance from the stove.

How the principal winds of the earth resemble these currents

The greater winds of the earth may be compared to this movement of air in a room. Here, however, the broad torrid zone, which is warmed by the sun's rays, takes the place of the stove. In the torrid zone the hot sun heats the air, thus causing it to expand and become lighter, just as the air does about the hot stove. The cooler, heavier air to the north and south of the torrid zone then flows in and pushes the light air up and away. Such a flowing of the air is what we call *wind*.

This vast movement of the air is illustrated in Figure 228. The letter *E* stands for the equator. The arrows represent the cooler air, north and south of the equator, as crowding in toward that section, then rising, and returning once more to the north and south.

Names of the principal winds on the earth

The air that flows toward the torrid zone causes very regular winds that are called *trade winds*. They start in both the north and south temperate zones, hundreds of miles away, and blow toward the equator day after day and month after month.

Since the heated air must escape somewhere, it rises far above the surface of the earth, and then flows back in the same direction from which it came. This forms the *return trade*, or *anti-trade winds* (Fig. 228). The atmosphere extends many miles above the earth, so that there is plenty of room for two winds, one above the other, blowing in opposite directions.

Being cooled on account of its great height, the air of the anti-trades slowly settles, some of it coming to the surface at about a third of the distance to the poles. There it spreads out, a part continuing on toward the poles, a part returning to the equator as the trade winds. Point out the arrows that show these movements in Figure 228.

Thus, as you see, these currents in the atmosphere closely resemble those in the room. In both cases air moves (1) *in* toward a heated place, (2) then *up*, then (3) *outward* and *down*, and once more (4) *inward* toward the heated part. Make a drawing to illustrate these *four* directions of movement of the air.

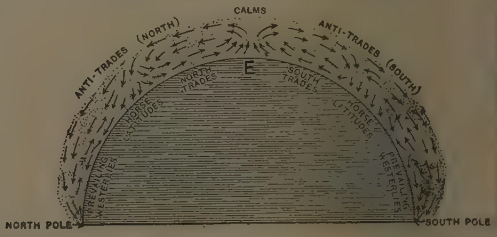


FIG. 228. — Diagram to show, by arrows, the movement of the greater winds of the earth.

Effects of earth's rotation on direction of these winds

There are differences, however, and one of them is especially important. In the room, the currents move *directly* toward the stove; then, after rising, moves directly away from it. If the earth stood still, the trade winds also would blow directly toward the equator from the north and south; and the anti-trades would blow directly away from it.

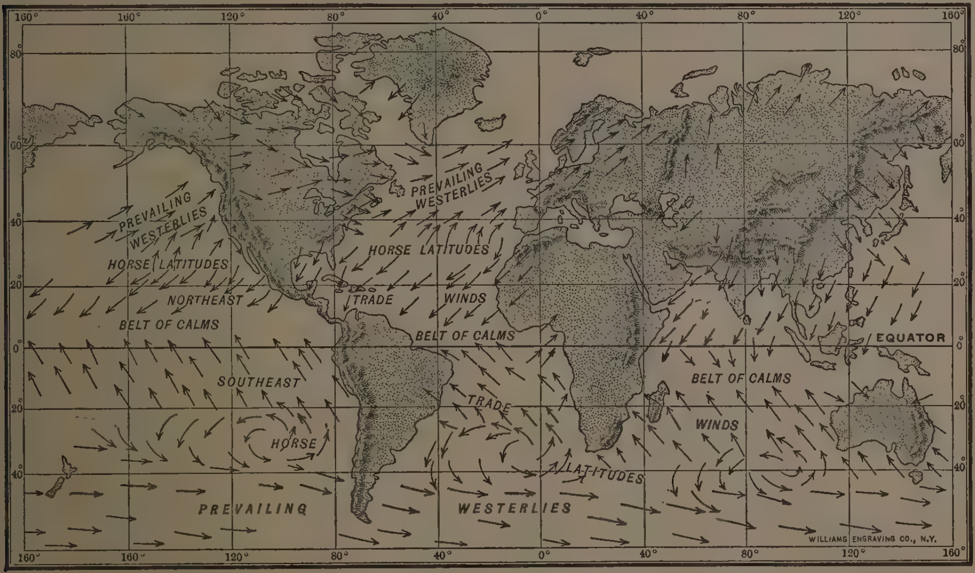


FIG. 229. — A diagram to show the principal wind belts of the earth.

As you know, however, the earth rotates from west to east at a rapid rate. This rotation causes the trade winds to be turned from their straight course toward the equator. Those in the northern hemisphere are turned to the *right*, so that they blow from the *northeast* instead of from the north. Those in the southern hemisphere are turned toward the *left*, and therefore they blow from the *southeast* instead of from the south.

The anti-trades are also turned toward the right in the northern hemisphere, where they blow from the southwest, and toward the left in the southern hemisphere, where they blow from the northwest. The exact reason for this effect of rotation is far too complex to state here; so that only the facts are given without explanation.

The great wind belts

It is now easy to see why the West Indies, Central America, and southern Mexico receive such regular winds from the northeast. They lie in the belt of the northeast trade winds just described.

The prevailing west winds of the Pacific coast are a part of the air of the anti-trades that has settled to the surface and is moving on toward the east. If you watch the higher clouds, you will find, in most parts of the United States, that they are moving toward the east. Even at the surface, the winds blow from the west more often than from any other quarter. In the northern part of the United States and in Canada, the winds blow so often from the west, northwest, or southwest, that this whole region is known as the region of the *prevailing westerlies*.

Regular winds, such as are found in North

America, are likewise found in most other parts of the world. In other words, there are several belts of regular winds extending around the earth. Figure 229 shows these clearly. Point out the belt of *trade winds* north of the equator. Point out the *prevailing westerlies*. Point out the two similar wind belts on the south side of the equator.

Why the winds are most regular over the ocean

Notice how much more distinctly these belts are shown over the ocean than over the land. There are several reasons why winds blow much more steadily over the ocean than over the land. The principal one is that the temperature of the water does not change so quickly as that of the land. On the land one place may become much warmer than another not far away, and then winds blow toward the warmer section. This often changes the direction of the regular winds on the land.

The belt of calms; and the belts of light and variable winds

Besides the four belts of winds just mentioned, there are three other belts in which it is either calm, or else there are only light, variable winds. The most important of these is called the *belt of calms* (Figs. 228 and 229), which is several hundred miles in width. This belt is situated where the trade winds from the northeast and those from the southeast die out. It is in this belt that the heated air in the torrid zone is rising. Since it is moving *upward*, no wind can be felt, and this is, therefore, a belt of prevailing calms. What winds there are, are usually light and changeable.

Northern Mexico and Southern California are situated in another belt of light winds with frequent calms. This is the belt where the air of the anti-trades is *settling* toward the earth; and settling air, like rising air, does not cause winds. This region is known as the *horse latitudes*. Point out the belt on Figures 228 and 229. Show the corresponding belt on the south side of the equator.

2. Rain

Relation of winds to rain

Knowing the wind belts that encircle the earth, we have a key to the principal rain belts; for the winds are the water carriers of the earth. Water that is evaporated from the surface of the oceans and of the lands is borne along in the air in the form of vapor. It descends to the earth as rain or snow, falling in great abundance in some places, and scarcely at all in others.

Principal cause of rain

To understand the cause for the change of vapor to rain or snow, it is necessary, first of all, to know that there can be more water vapor in warm than in cool air. Quite warm air can hold much more vapor than cold air.

For this reason, whenever air is cooled sufficiently, some of the water vapor which it bears is condensed. For example, vapor condenses on a cold glass because the air next to it is cooled; and dew forms on grass when the air near the ground grows cool in the evening. In a like manner, the vapor in our breath is condensed, thus forming a little cloud, when we breathe into the cold air of a winter day. Rain is also caused by the cooling of air which contains vapor.

One important cause for the cooling of air is that it expands on rising above the surface. Perhaps you have noticed how cool the air feels as it rushes out from a bicycle tire when you open the valve. The coolness is due to the expansion of the air as it comes out. In a similar way, when air rises above the surface of the earth, it expands, because there is less air above to press upon it. Then it grows cool; and while doing so, some of its vapor may be condensed to form clouds and raindrops.

This is the chief reason why winds from the ocean cause rainfall on mountain slopes and plateaus. The air is forced to rise in order to pass over the highlands, and that allows it to expand and grow cool. For the same reason, air that rises in the warm parts of the earth, like the belt of calms, also gives up vapor to form rain. Briefly, — *when air rises, it expands and cools; and then rain usually follows.*

One reason for dry weather

On the other hand, air that is settling grows warmer; and, instead of giving up its vapor, it becomes dry and clear. This may again be illustrated by the bicycle; for when air is pumped into the tire, the pump becomes warm as the air is made denser, or is compressed, by pumping. In a like manner, air that is descending toward the earth's surface is compressed and warmed because of the great pressure of the atmosphere above. Since there can be more vapor in warm than in cool air, such settling air currents become steadily drier. They cause clouds to disappear, and water to be evaporated from the ground. This is the reason why the horse latitudes are arid belts; for, as you remember, the air in these belts is settling from above. Briefly, — *when air descends, it becomes denser and grows warmer; then the sky is clear and the weather dry.*

The regular rain belts

1. In North America

These facts have been well illustrated in the rains of North America. The northeast trade winds, having gathered a large amount of vapor from the ocean, deposit it on the windward slopes of the West Indies, southern Mexico, and Central America (Fig. 230). The southwestern slopes of the West Indies, however, receive a much smaller quantity of rain; and the western coast of Mexico is quite arid.

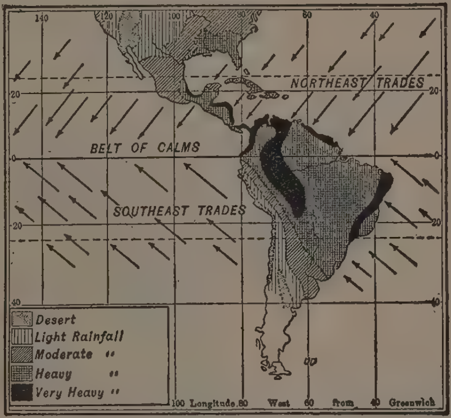


FIG. 230. — The rainy east coasts and arid west coasts of the trade wind belts. Also the rainy belt of calms of South America.

Farther north the prevailing westerlies, having traveled a long distance over the Pacific Ocean, likewise cause heavy rains along the western coast of North America (Fig. 231). But these winds also lose much of their moisture in passing over the Western highlands; and the land farther east, therefore, receives very little rain.

Northern Mexico and the southwestern part of the United States, lying within the horse latitudes, where the air is descending, also receive very little rain and are arid (Fig. 231). This is true even at the seashore in Southern California.

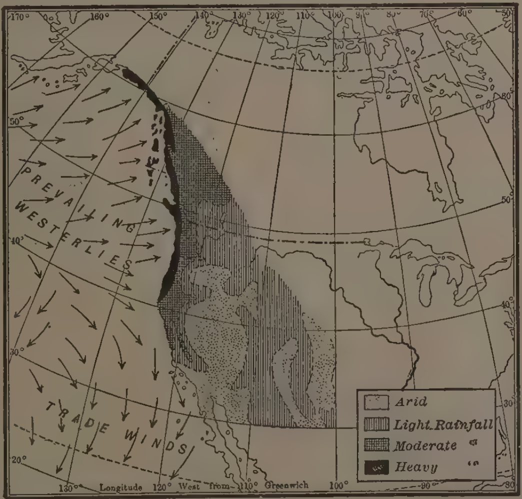


FIG. 231. — The heavy rainfall where the prevailing westerlies blow over the rising coast. What is the condition farther east? What is the case where the trade winds blow? Why?

2. In other regions north of the equator

Other regions lying within the regular wind belts show the same conditions of rainfall. For example, note what heavy rains the northeast trade winds bring to northern South America (Fig. 230), to southeastern Asia (Fig. 234), and to the islands near by, such as the Philippine Islands.

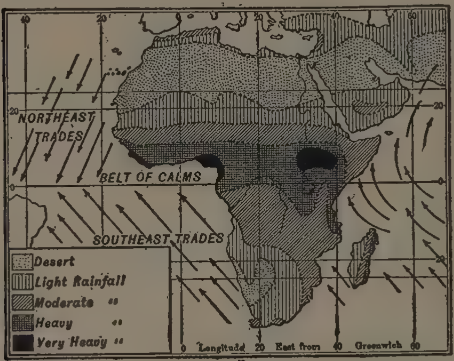


Fig. 232. — To illustrate the desert regions in the trade wind and horse latitude belts of Africa. Also to show the heavy rainfall in the belt of calms. Find the similar belts on Figures 230, 231, and 233.

In western Asia and northern Africa, on the other hand, these winds deposit little moisture, as is clearly shown by Figures 232 and 234. One cause for this is that, before reaching these regions, the trade winds have been blowing a long distance over the land, and not over the oceans. For this reason they have little vapor to deposit. Another very important reason is that the air is moving from a cooler to a warmer region, and is steadily becoming warmer. Instead of being forced, therefore, to give up its moisture, it takes *more* vapor. Thus in this region the trade winds take up water wherever they find it; and instead of causing rain they are really *drying winds*. This accounts for the Sahara and some other deserts.

The *prevailing westerlies* reach Europe, as well as North America, and cause abundant rainfall on the western coast. Since there are no lofty mountains on the west coast of Europe, however, there is no arid and desert land in this part of the west wind belt. On the other hand, the three peninsulas of southern Europe, like Southern California, lie partly within the horse latitudes; and for this reason there is little rain, especially in their southern portion.

3. In regions south of the equator

South of the equator the southeast trade winds cause heavy rains on the east coast of South America (Fig. 230); then, crossing the continent, they give up more vapor in ascending the eastern slopes of the Andes. The air is so drained of its vapor here, that when it descends on the western side of the mountains, there is little left. For this reason the southern parts of Peru and northern Chile, even within sight of the Pacific Ocean, form one of the most desert regions of the earth. Southern Chile, on the other hand, being in the belt of the prevailing westerlies, has plenty of rain (Fig. 232).

Most of Australia is in the southeast trade wind belt. Therefore, rainfall is ample on the eastern coast; but since the highlands on this continent are close to the east coast, nearly all the remainder of the country suffers for want of rain (Fig. 233). The south-

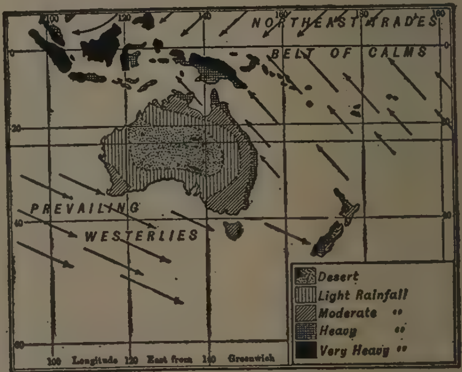


Fig. 233. — Showing the heavy rainfall on the east-facing coast of Australia where the trade winds blow. Notice also the arid interior and west coast. What is the condition in the belt of calms? What resemblance do you see to Figure 231?

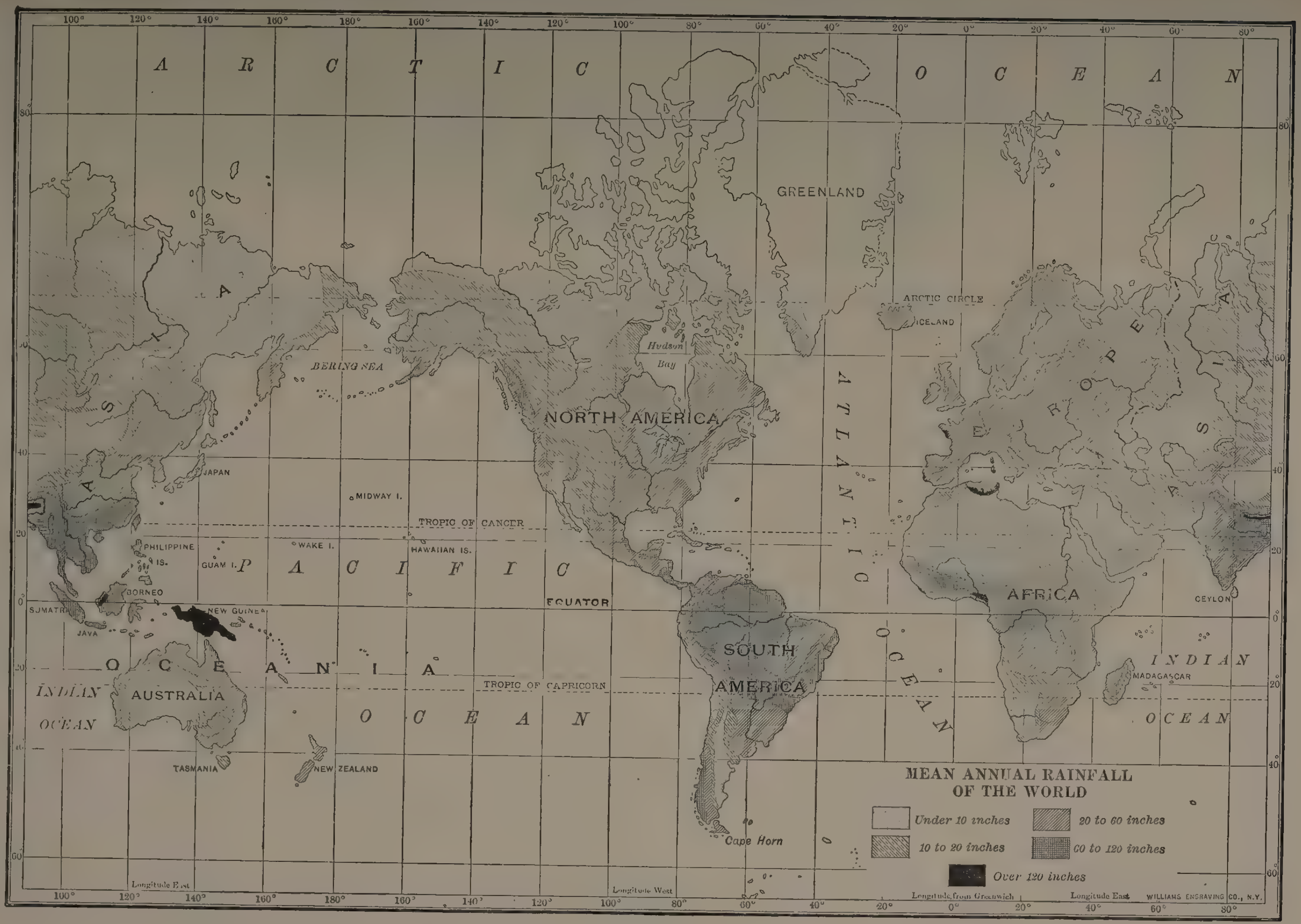

MEAN ANNUAL RAINFALL
OF THE WORLD
Under 10 inches
10 to 20 inches
20 to 60 inches
60 to 120 inches
Over 120 inches
ARCTIC OCEAN
GREENLAND
ARCTIC CIRCLE
ICELAND
ASIA
EUROPE
BERING SEA
Hudson Bay
NORTH AMERICA
ATLANTIC OCEAN
JAPAN
MIDWAY I.
TROPIC OF CANCER
PHILIPPINE IS.
WAKE I.
HAWAIIAN IS.
GUAM I.
PACIFIC
EQUATOR
BORNEO
SUMATRA
NEW GUINEA
JAVA
OCEANIA
INDIAN OCEAN
AUSTRALIA
TROPIC OF CAPRICORN
OCEAN
TASMANIA
NEW ZEALAND
SOUTH AMERICA
Cape Horn
AFRICA
CEYLON
MADAGASCAR
INDIAN OCEAN
Longitude East
Longitude West
Longitude from Greenwich
WILLIAMS ENGRAVING CO., N.Y.

FIG. 234.

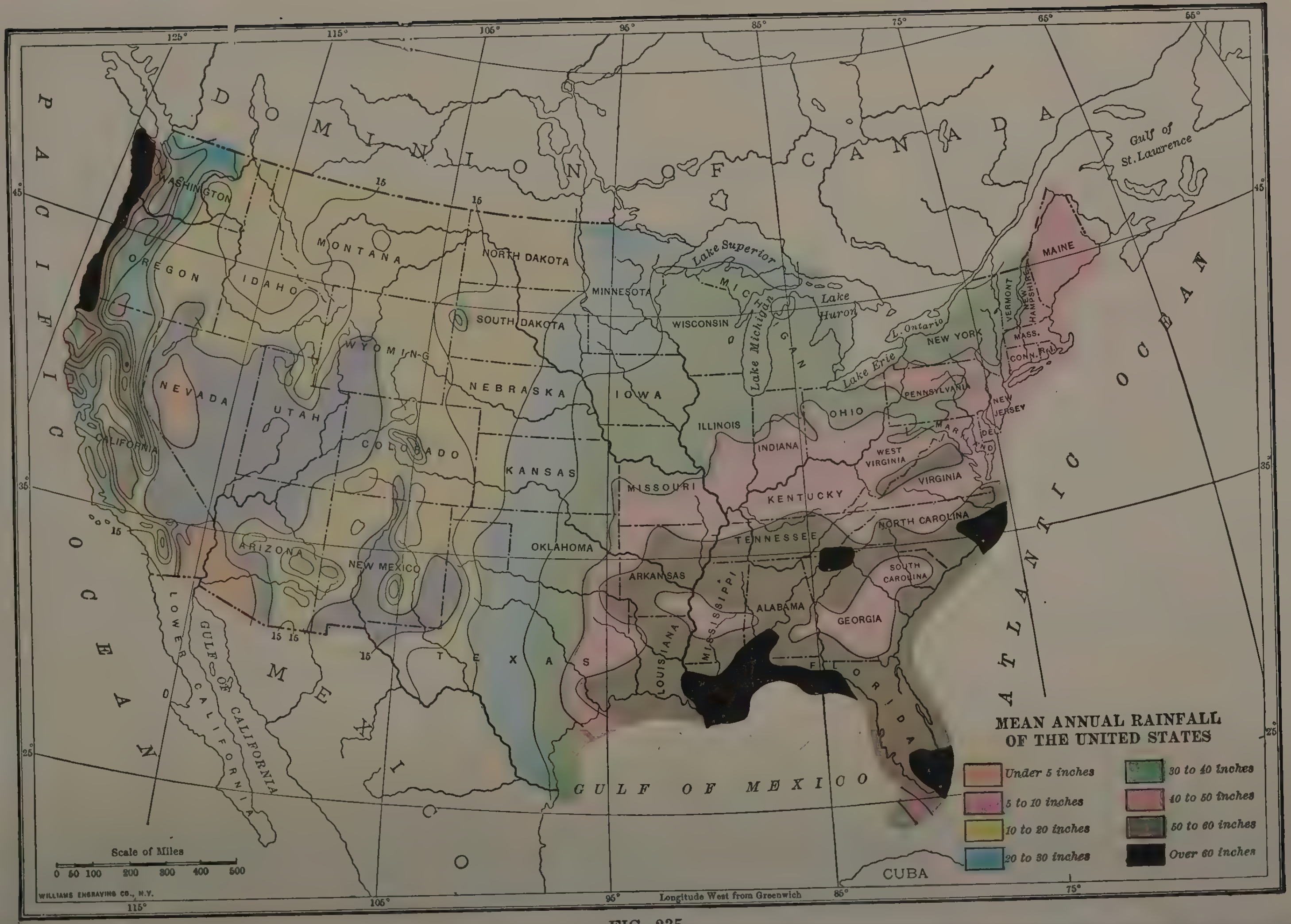

MEAN ANNUAL RAINFALL
OF THE UNITED STATES
Under 5 inches
5 to 10 inches
10 to 20 inches
20 to 30 inches
30 to 40 inches
40 to 50 inches
50 to 60 inches
Over 60 inches
DOMINION OF CANADA
Gulf of St. Lawrence
ATLANTIC OCEAN
PACIFIC OCEAN
GULF OF MEXICO
MEXICO
GULF OF CALIFORNIA
LOWER CALIFORNIA
CUBA
WASHINGTON
OREGON
CALIFORNIA
NEVADA
IDAHO
MONTANA
WYOMING
UTAH
ARIZONA
COLORADO
NEW MEXICO
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
OKLAHOMA
TEXAS
MINNESOTA
IOWA
MISSOURI
ARKANSAS
LOUISIANA
WISCONSIN
ILLINOIS
MICHIGAN
INDIANA
OHIO
KENTUCKY
TENNESSEE
MISSISSIPPI
ALABAMA
GEORGIA
FLORIDA
SOUTH CAROLINA
NORTH CAROLINA
VIRGINIA
WEST VIRGINIA
PENNSYLVANIA
NEW YORK
NEW JERSEY
MARYLAND
DEL.
VERMONT
NEW HAMPSHIRE
MAINE
MASS.
CONN.
R.I.
Lake Superior
Lake Michigan
Lake Huron
Lake Erie
L. Ontario
15
125°
115°
105°
95°
85°
75°
65°
55°
45°
35°
25°
Scale of Miles
0 50 100 200 300 400 500
Longitude West from Greenwich
WILLIAMS ENGRAVING CO., N.Y.

FIG. 235.

western tip of Australia, the island of Tasmania, and the southern island of New Zealand, like southern Chile, are reached by the prevailing westerlies; and for that reason they receive abundant rain.

4. In the belt of calms

The belt of calms is the most rainy of all the belts (Figs. 230, 232, and 234), because its hot, moisture-laden air is rising and cooling. After a clear night in that region, the sun usually rises in a cloudless sky. As the morning advances, and the heat grows more intense, the damp air rises more rapidly; then small clouds appear, and they grow steadily until rain falls from them. Showers occur almost every day, increasing in the afternoon. When the sun sets, and less air rises, the clouds melt away, the stars appear, and the night is as clear as before. Our hot, muggy summer days, with heavy thunder showers in the afternoon and evening, illustrate the weather that is repeated, day after day, in this belt of calms.

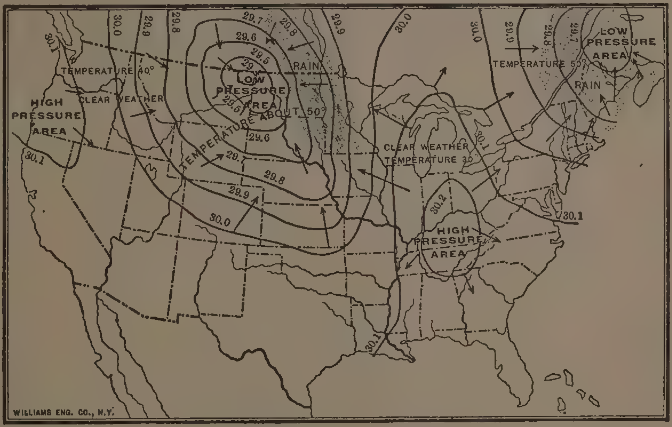


FIG. 236.—A weather map of the United States on a winter's day. The lines are lines of equal air pressure,—the lower the figure, the lighter the air (29.5 representing lighter air than 29.7). The pressure is determined by an instrument called the barometer.

Regions of irregular rains

1. In eastern United States and Canada

(1) *Kind of weather here*

Thus far only the *regular* wind and rain belts have been considered. From what been said, one might expect that the west winds, so dry after passing over the highlands of western United States, would continue eastward and cause our Central and Eastern States to be arid. As a matter of fact, we know that abundant rain falls in this section, as shown by Figure 235. We know, too, that there are no very regular winds over this entire area; on the contrary, both winds and temperature are quite changeable. In any particular locality it may be warm and pleasant, with a south wind on one day; the next day a cool, dry wind may blow from the northwest; after two or three days this may give place to a cloudy sky and rain, brought on by south or east winds; and then fair, cool weather, with northwest winds, may again set in.

(2) *The reason for such weather*

The reason for such changeable weather here is that this region is crossed by great storms, moving from west to east. When such storms begin in the Northwest, there is a large area there with lighter air than that over the surrounding region. Such an area is called a *low pressure area* (Fig. 236). The heavier air, from the surrounding country, flows toward this low pressure area. This causes winds which on the south side blow from the south, on the east side from the east, and so forth (Fig. 236).

The air that flows in from all sides rises near the center of the low pressure area. As it rises, the vapor condenses, forming clouds and rain, as in the belt of calms. Such an area of low pressure, with its clouds and rain, is known as a *cyclonic storm area* (Fig. 237).

Instead of remaining in one place, the cyclonic storms travel steadily onward, usually beginning in the northwest, and *al-*

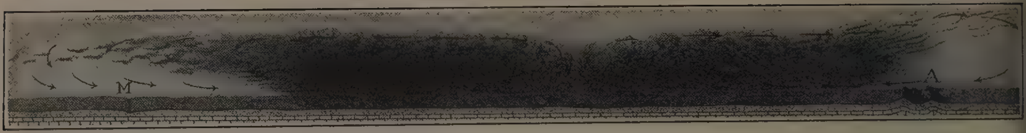


Fig. 237. — A diagram section through a cyclonic storm area. The arrows show the direction of the winds; the shaded area represents cloud and rain. Such a storm covers a very large area, often from the Mississippi River (M) to the Appalachian Mountains (A).

ways passing eastward (Fig. 238). The paths followed by the storm centers generally pass over the Great Lakes, and down the St. Lawrence Valley to the ocean. They move eastward because the prevailing westerlies carry them along; indeed, these great cyclonic storms appear to be whirls, or *eddies*, in the prevailing westerlies, somewhat like the eddies in the current of a stream.

(3) *The movement of the cyclonic storms, and their extent*

These storms bring most of the rain that falls in the United States and Canada, east of the Rocky Mountains. The area of country upon which the rain may be falling from the clouds of one of the cyclonic storms is sometimes very great. Indeed, places fully a thousand miles apart sometimes receive rain at the same time, from the same storm (Fig. 237). As the storm moves eastward, the weather begins to clear on the western side (Figs. 236 and 238).

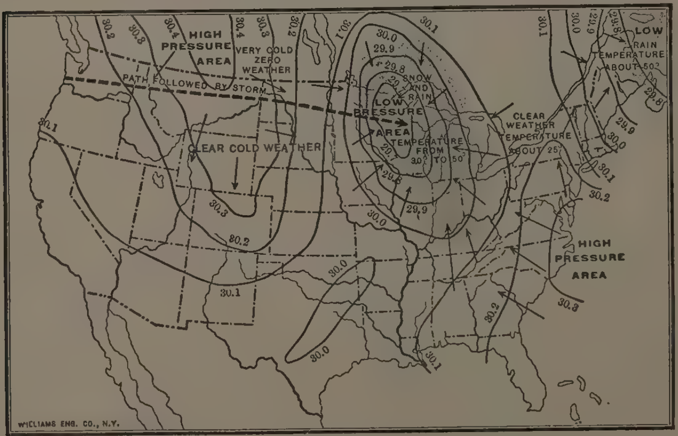


Fig. 238. — Weather map for the day following that of Figure 236. Study this carefully, and tell how it differs from Figure 236.

The vapor that causes the rain in these storms is brought from the Gulf of Mexico and the Atlantic Ocean, being carried by the winds for hundreds of miles, even into Canada.

Not only are rains caused by these storms, but hot spells, and other changes as well. Warm winds, blowing from the south toward the low pressure areas, are the cause of the winter thaws and the summer hot spells, which are common in the Eastern and Central States. It is during the hot spells that thunderstorms come; also, in some places, *tornadoes*, often called *cyclones*, in which the winds blow so fiercely that houses are torn to pieces.

(4) *Their different effects on the weather*

After a low pressure area has passed eastward, and the storm is over, the wind generally blows from the west. This causes cool, dry weather in summer, and cold snaps in winter. The latter are often so severe that they are called *cold waves;* and these, sweeping over the East, and even in the South, often do great damage to fruit trees and delicate plants.

While the cyclonic storms are quite irregular, they are almost certain to come whenever a wide area of low air pressure appears in the West. Thus, by watching the pressure of the air, as shown by instruments called *barometers*, it is possible to predict such a storm; and since they always move toward the east, it is possible, by further study of

(5) *Possibility of predicting these storms*

the barometer, and of the winds, to predict their course somewhat accurately, and thus warn people of their coming.

(6) *How the predictions are made, and how people are warned*

This work is so important that the United States government employs a large force of men, stationed in different parts of the country, to observe the pressure of air, direction of wind, etc. The observations are made at the same time at all stations, and telegraphed to the central office at Washington. A special branch of the government, called the *Weather Bureau*, has been established to have charge of this work.

The storm predictions are telegraphed from Washington to all parts of the country, so that one knows what kind of weather to expect a full day before it comes. These predictions are usually printed in the newspapers, as you no doubt know.

Maps, called *weather maps*, are also sent out in great numbers. Figures 236 and 238 are made from such maps. Figure 236 shows a cyclonic storm in the Northwest, the arrows indicating how the winds blow, from all sides, toward the center of low pressure. Farther east is a region of high pressure. In Figure 238, the high and low pressure areas are again represented; but, since it is a day later, they have both moved eastward; and the following day they would be still farther east.

From these maps you can see how the direction of the wind, for any one locality, changes as the low pressure areas pass over the country. By them, also, any person may see what the weather promises to be in all parts of the country, and may follow the changes from day to day.

(7) *Value of such warnings*

By the predictions of the Weather Bureau, farmers and gardeners are warned against damaging frosts, and sailors against severe storms. Hundreds of thousands of dollars are saved in this manner every year. Especially valuable service has been rendered by the Weather Bureau in predicting the fierce *hurricanes* that start in the West Indies and sometimes do great damage there, as well as on our own coast. These resemble the cyclonic storms, but are much more destructive. They often pass along our eastern coast, and then eastward out into the Atlantic.

Since the storms and high pressure areas have so great an influence on our weather, you will find it of interest to study the weather yourself. Watch the changes in wind, temperature, clouds, and rain; and if there is a barometer at hand, observe how it changes as the high and low pressure areas come and go. You might also examine the weather map and watch the weather that follows, to see how accurately the map predicts the weather.

2. Regions of irregular rains in Europe

Since Europe, like the United States, is mainly in the belt of prevailing westerlies, it also is visited by cyclonic storms. Many of the storms that cross our country pass over the ocean, and travel far into Eurasia before they die out. There, as here, the area upon which rain may be falling during one of these storms is sometimes very great. As in our country, the weather is made changeable by these storms; it may be warm and pleasant one day, stormy the next, then clear and cool, or cold.

Review Questions

1. Explain the currents of air that are caused by a hot stove in a room. 2. Show how the principal winds of the earth resemble these currents. 3. Name the principal winds of the earth. 4. What is the effect of the earth's rotation on the direction of these winds? 5. Locate the principal wind belts on the earth's surface. 6. Why are the winds most regular over the ocean? 7. Locate the belt of calms; and the two belts of light and variable winds. 8. Explain the principal cause of rain. 9. Give one reason for clear, dry weather. 10. Locate the regular rain belts in North America. 11. In other regions north of the equator. 12. In regions south of the equator. 13. In the belt of calms. 14. Describe the more irregular weather in our Eastern States and in eastern

Canada. 15. Explain the reasons for such weather. 16. In what direction do the cyclonic storms move, and what is their extent? 17. How do cyclonic storms affect our weather? 18. What about the possibility of predicting these storms? 19. How is that work managed? 20. How are the warnings of value? 21. What about regions of irregular rains in Europe?

Suggestions

1. Estimate the number of barrels of water that falls on an acre of ground, or upon a city block, in one year, where the rainfall is forty inches. 2. How is a movement of air secured in your schoolroom in order to ventilate it? 3. Make a drawing to show the direction of the regular winds of the earth. 4. Watch the higher clouds to see in what direction they are moving. 5. Write an account of the changes in weather for five days in succession: the wind direction and force; the clouds; rain; temperature; and, if possible, the air pressure.

IV. Ocean Movements, and their Effects; also Distribution of Temperature

1. Ocean Movements, and their Effects

Like the air, the ocean water is in motion. Its three principal movements are wind waves, tides, and ocean currents. The movements of the water, like those of the winds, are of the greatest importance to us.

(1) *Wind Waves and Tides*

Wind waves

Waves are formed by winds which blow over the surface of the water and ruffle it. Sometimes, during storms, the heavy winds pile up the water in waves that are from twenty to forty feet high. Even such great waves are rarely very dangerous to large vessels in the open ocean; but upon the seashore they do great damage to vessels, and even to the coast itself. The constant beating of the waves is slowly wearing the rocks away and dragging the fragments out to sea, thus cutting the coast back.

Tides

1. What the tides are

People living upon the seacoast know that the ocean water rises for about six hours, and then slowly falls for the same period. This rising and falling of the water, twice each day, forms what is known as the tides.

2. The cause of tides

For a long time men were puzzled to explain this movement of the ocean. It was called the breathing of the earth; and to this day, certain uncivilized races think that the tide is caused by some great animal.

As a result of much careful study, it has been learned that the tides are caused by the

Fig. 239. — The ocean waves running on to the beach in great breakers.

moon and the sun, especially the former. Each of these bodies is pulling upon the earth, by the attraction of gravitation, much as a horseshoe magnet pulls upon a piece of iron. Since the ocean is a liquid, this "pull" draws it slightly out of shape. This causes two great swells, or waves, many hundreds of miles broad, one on each side of the earth. They sweep across the oceans, following the moon, and, on reaching the coast, cause the rise of water known as the tide.

3. Height of the tidal wave

The tidal wave is only two or three feet high upon islands in the open ocean; but it rises a great deal higher in many bays because the space that it occupies becomes narrower near the head of the bay. In some places, as in the Bay of Fundy, the tide reaches a height of forty or fifty feet.

The height of the tide also varies from day to day; for the moon and sun, which combine to form it, do not always work together. At new moon, and at full moon, — when the earth, moon, and sun are nearly in a straight line, — the moon and sun pull together. They then make the tidal wave higher than at the quarter, when the sun is pulling in one direction and the moon in another. The high range of tides at full and new moon are called *spring* tides; those at the quarters, *neap* tides.

4. Effects of tides

In the open ocean, the tides are of little or no consequence. But along the coast, where the water rises and falls against the beaches and cliffs, they are of much importance. Where the coast is irregular, the tide is often changed to a *current*, which sometimes moves so rapidly that a sailing vessel cannot make headway against it, but must wait until the tide changes. Such a rapid current is found in one of the entrances to New York Harbor, at what is known as Hell Gate, where the channel is narrow and rocky.

(2) *Ocean Currents*

Main cause of ocean currents

The winds which blow over the ocean, forming waves, also drift the water before them. You yourself can cause such a movement, in a small way, by blowing on the surface of a pail of water. This starts a current, or drift, of surface water in the direction of the moving air. Where the winds blow steadily, as in the trade wind belts, there is a permanent drift of water, pushed along by the prevailing winds. In this way a great system of ocean currents is formed (Fig. 240), which have an important influence on the temperature of the earth.

In our study of North America it was several times necessary to refer to two of these currents, the Gulf Stream and the Labrador Current. We shall now study the ocean currents, on each side of our continent, more fully.

The North Atlantic Eddy

In the eastern part of the Atlantic, where the trade winds blow, the surface water on the two sides of the equator drifts slowly in the direction of the trade winds; that is, toward the belt of calms (Fig. 229). The water then moves westward, as a great *Equatorial Drift*, until it reaches the coast of South America, which interferes with its course (Fig. 240). There the drift of water is divided, a part being turned southward, while the greater portion proceeds toward the northwest.

The part that flows northwest is turned toward the right by the effect of rotation, as the winds are (p. 195); and the part that flows into the South Atlantic is turned to the left, also by the effect of rotation. The northern drift keeps turning to the right, and therefore, instead of continuing along the American coast, swings out into the Atlantic toward Europe. Continuing to turn, it then passes southward, and finally returns to the trade wind belt, where it started, having made a complete circuit.

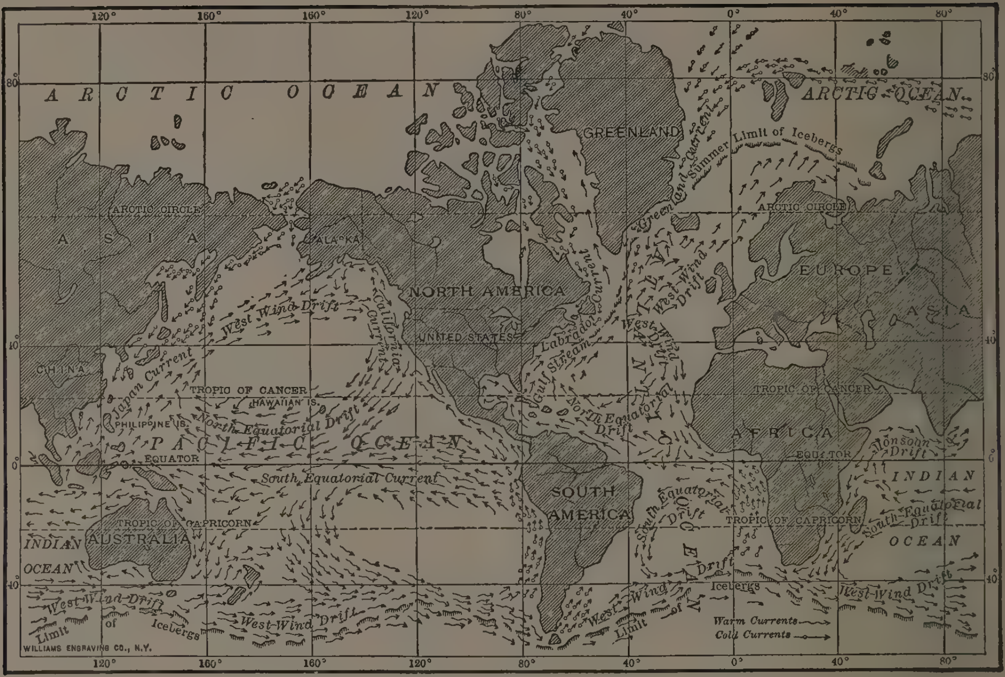


FIG. 240. — A chart showing the principal ocean currents and ocean drifts of the world.

This circular drift of water in the North Atlantic is called the *North Atlantic Eddy* (Figs. 240 and 241).

Coming from the equatorial region, the water in this huge eddy is warm, and in it live countless millions of animals and floating plants. Among the latter, one of the most abundant is a seaweed, called *Sargassum*, some of which is thrown into the middle of the great eddy. There it has collected until it now forms a *grassy*, or *Sargasso, sea*, hundreds of square miles in extent. Since the Sargasso Sea lies directly between Spain and the West Indies, Columbus was obliged to cross it on his first voyage of discovery; and his sailors, upon entering it, were much alarmed lest they might run aground, or become so entangled in the weed that they could not escape.

The Gulf Stream

A portion of the drift of water which moves toward the northwest along the northern coast of South America, enters the Caribbean Sea and then passes into the Gulf of Mexico. This forms a broad, deep, gently flowing current into these inclosed seas, which are so nearly surrounded by warm tropical lands that the water grows even warmer than it was before.

After swirling slowly round the Gulf of Mexico, the water escapes between Cuba and Florida. The current then becomes known as the *Gulf Stream* (Fig. 241), because it comes from the *Gulf* of Mexico. Being forced to pass out through so narrow an opening, its rate of movement is much increased, as water in a hose is made to increase its speed by passing through the nozzle. Measure the distance from Key West to Havana (Fig. 154). Near here the Gulf Stream flows as fast as four or five miles an hour.

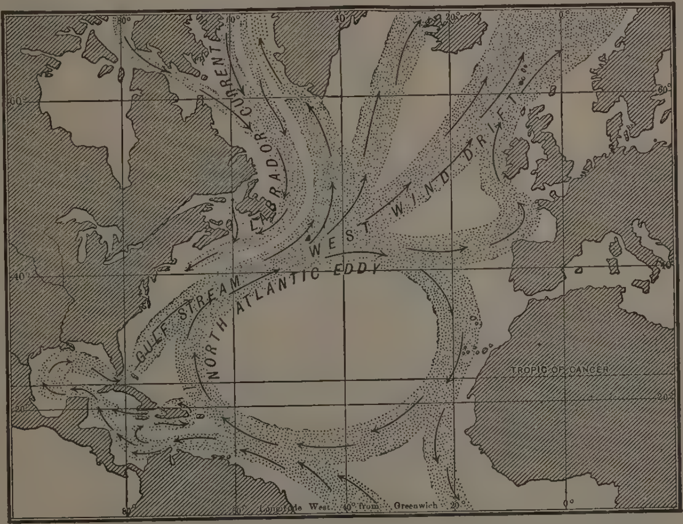
Being turned to the right by the effect of the earth's rotation, the Gulf Stream soon leaves the American coast and flows northeast toward northern Europe. It broadens rapidly and joins forces with the western part of the great North Atlantic Eddy. In crossing the Atlantic, this combined current, or drift, is pushed along by the prevailing westerlies, so that it reaches the shores of northern Europe, and even enters the Arctic Ocean. In this part of its course the current is called the *West Wind Drift.* Some idea of its volume may be gained from the fact that it carries many times as much water as all the rivers of the world together.

The Labrador Current

Some of this water returns in a cold surface current, called the *Labrador Current,* which flows southward along our northeastern coast (Fig. 240). Starting from among the islands of northern North America, the Labrador Current flows past the coast of Labrador, Newfoundland, Nova Scotia, and New England as far as Cape Cod. Like all ocean currents in the northern hemisphere, it is turned toward the right; that is, since it flows southward, toward the west. This causes it to follow our coast very closely, keeping nearer our shore than the Gulf Stream does.

Since there are two currents near together, a cold one from the north, and a warm one from the south, a vessel sailing from Boston to England must cross both. In winter, during a storm, a ship often becomes covered with snow and ice while in the cold Labrador Current; but soon after entering the warm current this all melts away.

Where the cold and warm currents approach each other, dense fogs are common. The reason for this is that warm, humid winds from the Gulf Stream are chilled in crossing the Labrador Current. This causes some of the vapor to condense and form fog particles. The region near the coast of Nova Scotia and Newfoundland is one of the foggiest regions in the world, and therefore dangerous to vessels.



WILLIAMS ENG. CO., N.Y.

Fig. 241.—A diagram to show the currents of the North Atlantic. In order to illustrate the currents clearly it has seemed necessary to make them as if they were sharply bounded, like a river in its channel. However, the boundaries of these great currents and drifts are so indefinite that one would not be able to detect the boundaries.

Currents in the North Pacific

In the Pacific Ocean, as in the Atlantic (Fig. 240), the water is driven before the trade winds. Thus a broad drift is formed, moving westward in the belt of calms. Then a warm current swings to the right past Japan, crossing the ocean toward Alaska. This is called the *Japanese Current.* Continuing to turn to the right, this ocean drift passes southward to complete the vast eddy. There is also a cold current from the north, between the Japanese Current and the coast of Asia, corresponding to the

Labrador Current in the Atlantic, though smaller and not so cold.

From what has been said, we see that the *northeastern* coasts of both North America and Asia are swept by ocean currents from the cold north. On the other hand, the *northwestern* coasts of Europe and North America are approached by warm drifts of water from the south.

Eddies of the southern oceans

In the South Atlantic, South Pacific, and Indian oceans, there are eddies similar to those of the North Atlantic and the North Pacific. There is one very important difference, however. In the southern hemisphere the currents are turned to the *left*, instead of the right, by the effect of rotation. Some of the water of these eddies joins the broad *West Wind Drift* of the distant southern ocean; but much of it turns northward until it once more reaches the trade wind belt, thus completing the eddies (Fig. 240).

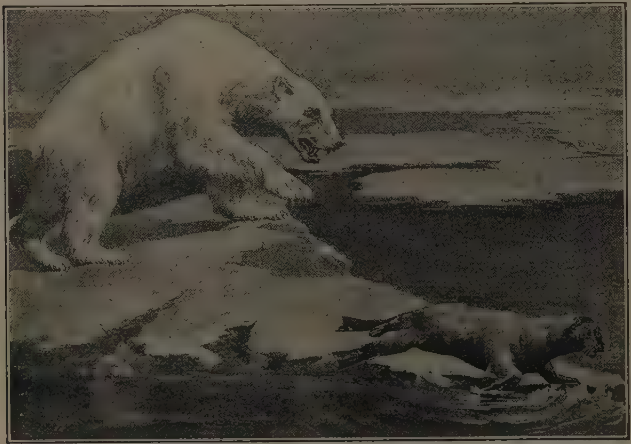


Fig. 242. — A polar bear hunting seal on the floe ice that is floating southward in the Labrador Current.

Effects of ocean currents on North America

The cold Labrador Current greatly influences the temperature upon the neighboring land; for winds that blow over the Labrador Current are cooled, and carry the chill far inland. This is one of the reasons why the east winds of New England are so cool, and why the New England coast is such an agreeable summer resort.

1. Effects of Labrador Current

The Labrador Current bears with it much ice from the Arctic region. Some of this is sea ice, or "floe ice," which has been frozen during the preceding winters, and some of it is in the form of gigantic icebergs which have broken off from the Greenland Glacier. Seals are commonly seen in the floe ice, and occasionally a polar bear, which preys upon the seal (Fig. 242).

Most of the sea ice melts before reaching Newfoundland; but the icebergs may be carried southward one or two thousand miles before the air and water melt them away. (See limit of icebergs on Figure 240.) Indeed, some icebergs float even as far south as the paths followed by vessels which cross the Atlantic. Since many of these bergs are larger than a large building, collision with one means shipwreck; therefore sailors need to use great caution, especially when a ship is in the fog.

2. Effects of the Gulf Stream

While winds from over the Labrador Current are chilly, those that blow from over the Gulf Stream are warm. They are also humid. During cyclonic storms, winds from the warm waters off our southern coast often carry both warmth and moisture far into the interior of the country. These winds greatly temper the climate of our Eastern and Central States, so that the Gulf Stream, as well as the Labrador Current, has an important influence on our climate.

3. Effects of warm currents in the North Pacific

The winds that blow over the warm waters of the North Pacific cause the climate of the Alaskan coast to be far warmer than that of southern Labrador in the same latitude. These prevailing west winds also bring an abundance of vapor to the Pacific coast, all the way from California to Alaska.

Where these winds blow, the winters are mild and the rain heavy; but the summers are cool, because the ocean water, though warmed, does not become greatly heated. On a globe notice that the state of Washington, with its pleasant climate, is in about the same latitude as the bleak island of Newfoundland, whose shores are bathed by the Labrador Current.

Effects of currents in other regions

1. On the Arctic Ocean

The warm West Wind Drift of the North Atlantic is of special benefit to the Old World. When Nansen started on his famous journey toward the north pole, he entered the Arctic Ocean where this current does. He was able to proceed much farther north than would have been possible along any other route, because the warm drift of water keeps this part of the Arctic free from ice in summer. Notice, on Figure 240, how much farther north the limit of icebergs is on the coast of Europe than on the American coast.

2. On western Europe

The west winds, warmed in passing over the West Wind Drift, have made possible the great civilized nations of northern Europe. Notice on a map, how many large cities of northern Europe are in the same latitude as desolate Labrador. How different these two regions are! One is highly civilized and densely settled; the other is occupied only by scattered savages. This difference is due largely to the ocean currents and the winds that blow over them.

Review Questions

1. What are the three principal movements of ocean water? 2. Tell what you can about the wind waves. 3. What are tides? 4. Explain their cause. 5. What about their height? 6. Mention some of their important effects. 7. Explain the main cause of ocean currents. 8. Describe the North Atlantic Eddy. 9. The Gulf Stream. 10. The Labrador Current. 11. The currents in the North Pacific. 12. The eddies of the southern oceans. 13. Explain the effects of the Labrador Current on North America. 14. Of the Gulf Stream. 15. Of the warm currents in the North Pacific. 16. State the effects of ocean currents on the Arctic Ocean. 17. On western Europe.

Suggestions

1. If your home is upon the seacoast, find out about the high and low tides there. 2. What course might a vessel take in order to be carried from Europe to America, and back again by ocean currents? 3. How do vessels try to avoid running into one another in dense fogs? 4. How about the distance of these points from the equator? 5. Locate the cold ocean currents of the world; the warm currents. 6. Estimate the length of the circumference of the great eddy in the North Pacific.

V. PLANTS, ANIMALS, AND PEOPLES OF THE EARTH

1. Plants and Animals

Life in the frigid zone

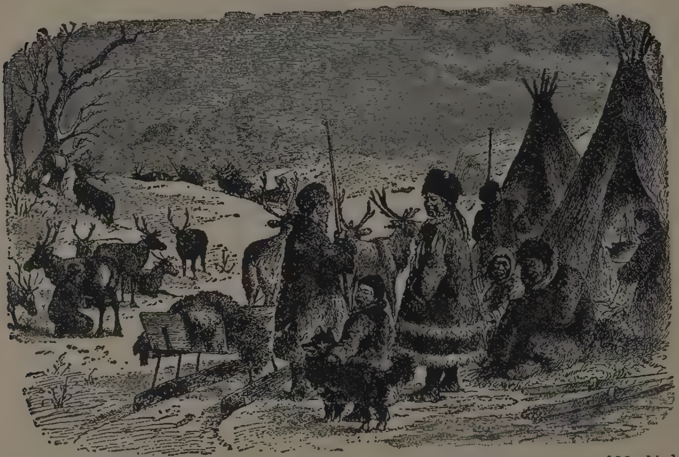
In our study of North America (p. 9) we found that there was little plant and animal life in the northern part of the continent. Give the reasons. What plants are found there? What about insect life? What large land animals are found, and how do they manage to live?

The life upon the *tundras* of northern Europe and Asia corresponds closely to that on the *barrens* of North America; and the few people found there live in much the same way as the Eskimos of North America. Besides the dog, however, the people of the tundras have the reindeer as a domestic animal (Fig. 243).

Life in the torrid zone

What countries of the New World are at least partly included within the torrid zone (Fig. 221)? Describe the climate of this part of North America (p. 11). What about the plant life found there (p. 11)? The animal life (p. 12)?

1. In the rainy section What portions of the Old World lie in the torrid zone? Extensive and dense forests are found in the rainy section of this zone in the Old World, as in the New. Animal life is abundant, too, since there is so much food.



From Ratzel's History of Mankind.

Fig. 243. — A camp in the tundra of northern Asia. The reindeer are used for drawing the sleighs and also as a source of milk and meat.

Among the animals insects are especially common. Some, like the beautiful butterflies, thrive because of the great number and variety of tropical flowers; others, like many species of ants, live in the decaying wood; and still others have their homes in the ground. Some are harmless; but many, like the ants, which swarm in vast numbers, are very troublesome.

There are many birds, too, including humming birds, parrots, paroquets, birds of paradise, and other species, which are far famed for their beauty. Among the mammals there is less variety and abundance. Some, like the monkeys and sloths, are tree dwellers; others, like the tapir, live in the swampy undergrowth. Some very large animals, such as the rhinoceros and elephant, still live in the dense forest, where it is difficult to hunt them. Occasionally, too, fierce animals, such as the tiger (Fig. 244), lurk in the densely growing vegetation, ready to pounce upon the more defenseless, plant-eating animals.

Reptiles also thrive in the warmth and dampness of the forests. Great boa constrictors twine themselves, like huge vines, among the trees and underbrush; and poisonous serpents are common. The bodies of standing water encourage water life, — for example, the turtle and alligator among reptiles, and the hippopotamus and manatee among mammals.

The labor required to clear away the dense tropical forest, and to keep it clear for farming, is far greater than in the temperate region of our country. This difficulty is increased, too, by the extreme heat, and by the damp, unhealthful climate. For these reasons, in spite of the very fertile soil, the zone of dense tropical forests is almost everywhere sparsely inhabited; and in nearly every case its

Fig. 244. — The tiger which lurks in the jungles of India.

inhabitants are indolent savages. They have become accustomed to the climate, and they easily secure an abundant supply of food from the surrounding trees and bushes. Thus they find little work necessary.

2. In the savannas

On either side of the tropical forest there is a belt where the temperature is always high, but where the rainfall varies with the season. Here abundant rain falls in one season, while the climate is very dry in the opposite season. Owing to the lack of rain during one season, dense forests are impossible; but some plants, such as grasses, thrive. These are therefore grass-covered lands, and are known as *savannas*.

FIG. 245. — The lion, sometimes called the king of animals.

The *downs* of northern Australia, the *park lands* lying both north and south of the equator in Africa, the *campos* of Brazil, and the *llanos* of Venezuela and Colombia, are all examples of savannas. They are dry and barren in one season, fresh and green in the other. Trees, such as palms, line the streams; but elsewhere the land is open prairie. Plant-eating animals roam about; in Africa, for example, the antelope, gazelle, zebra, giraffe, buffalo, elephant, and rhinoceros. In addition there are some flesh-eating animals, such as the lion (Fig. 245).

While tropical forests are suited only to the life of indolent savages, the open savannas invite human inhabitants, in spite of the heat. They also *compel* industry, because men must make provision for the period of drought. Therefore, even those African negroes who inhabit the grass lands keep flocks and carry on rude forms of agriculture. Where settled by white men, these savannas are to-day mainly grazing lands.

The savannas grade into tropical forests on the side next to the equator, but they gradually change into deserts on the other side.

3. In the desert

In the desert there are vast areas in which the sand is drifted before the wind and piled into sand hills, or *sand dunes*. There are also tracts glistening with salt where the water of lakes has evaporated and left salt upon the surface. Parts of the desert are broad plains; but there are also stony plateaus, deep valleys, and mountain ranges. Throughout most of the desert there is such a lack of rain that the surface is barren and desolate at all times.

Even in such a region, however, plants and animals are not entirely lacking. In some sections there are scattered clumps of coarse grass; and there are prickly plants, like the cactus, in which the leaves and stems are as compact as possible to prevent evaporation. In place of a dense tropical foliage, like that of the tropical forest, there is a notable absence of leaves. Indeed, a large part of the plant is under ground. This is because the roots must struggle hard to find the necessary moisture, and the portion above ground must use as little moisture as possible, and waste none; for years may pass before rain comes.

That the desert soil is usually fertile is proved by the fact that vegetation thrives wherever there is fresh water, as along a stream. Such watered spots in the desert are called *oases*. They make beautiful gardens in the midst of the barren desert.

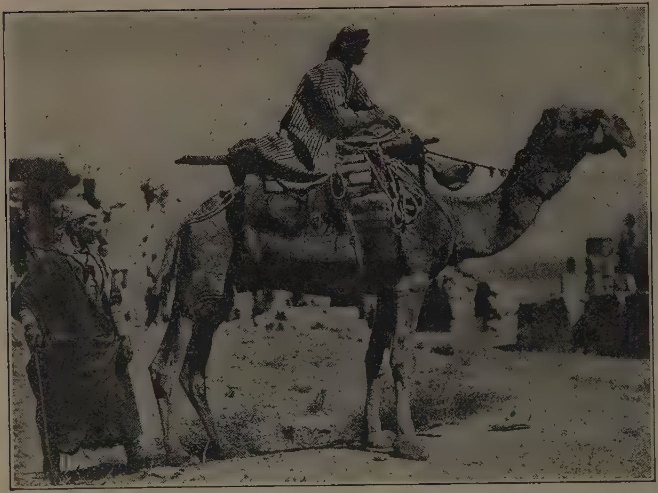


Fig. 246. — A camel on the desert of northern Africa.

One of the few large animals native to the deserts of the Old World is the ostrich. Another, much used by man, is the camel (Fig. 246). The camel well illustrates how animals become adapted to their surroundings. Each foot has a broad sole which aids the camel in traveling by preventing the feet from sinking into the sand. The nostrils can be closed when necessary, and the eyes are protected by thick lashes. Both of these devices help to keep out the sand, which is so often blown about. The camel is further provided with pouches in which enough water may be stored to serve its needs for two or three days. It also has a fatty hump, which furnishes nourishment to the body, so that the camel can go without food longer than most other animals.

Human beings naturally shun the desert. Permanent homes can exist only on the

Fig. 247. — A family of nomads and their tent on the Sahara desert in Morocco.

oases; but wandering tribes, or *nomads,* roam about over the desert. They live in tents (Fig. 247), and are engaged either in herding, or in driving caravans of camels laden with articles of trade.

Life in the temperate zones

What part of North America is included within the north temperate zone? What part of the Old World? What countries of South America are at least partly included within the south temperate zone? What part of Africa? Of Australia?

1. In the well-watered sections

The land of the temperate zones is in large part forest-covered. Thus a broad forest belt crosses the northern interiors of both North America and Eurasia. Owing to the moderate rainfall in some parts, and to the rigor of the climate in others, the forest is more open than in the tropical zone.

In the forests near the torrid zone, the trees are for the most part tropical in kind. In the cooler parts, however, they are mainly of two sorts: (1) the *evergreens,* including the pine, spruce, and hemlock, which have needle-like leaves that remain green throughout the winter; and (2) the *deciduous* trees, like the oak, maple, elm, and chestnut, whose leaves are much larger, but fall when frost comes. The temperate forest was the home of many wild animals, but these have now been greatly reduced in number. Name some of those of North America (p. 11). Owing to the coldness of the climate in the northern sections, these animals are protected by fur, which men find of much use.

There are some treeless plains even in those parts of the temperate zone where the rainfall is heavy enough for tree growth. Examples of these are the *prairies* in the United States and some of the plains in southern Russia.

In the temperate zones of the northern and southern hemisphere both the cleared forest lands and the humid, grass-covered plains have become the seats of extensive agriculture. In fact, the temperate zones are the agricultural regions of the world, and they might almost be called the *zones of grain* (Figs. 418, 419). Make a list of the grains that are cultivated; also of the fruits.

It is in the temperate zones, too, where man has developed most highly. The simple life of the savage in the tropical forest, and of the Eskimo in the cold regions, offers a striking contrast to the varied life of the agricultural people in the temperate belt. Not only are the latter more highly civilized, but they have so increased in numbers that the temperate zone is the most densely populated belt in the world. Suggest some reasons for this.

2. In the arid lands

In addition to the prairies there are other treeless, grass-covered lands in the temperate belts. These are usually in the interior of continents, on the border of the deserts, where the rainfall is light. In the Old World, where these arid tracts are called *steppes,* there is a broad strip of treeless land extending from southeastern Europe to central Asia. The *Great Plains* of western North America, and the treeless plains, or *pampas,* of Argentina are also steppes (Fig. 260).

On these steppes the melting snow and the spring rains cause the grass to be green in spring and early summer; but drought then changes it to gray and yellow. There are no trees excepting along the streams; and there is too little rainfall for agriculture without irrigation.

The wild animals are mainly grass eaters. Formerly the steppes supported great herds of deer, antelope, and bison; but cattle, sheep, horses, and camels have now largely taken their place. In the Old World the inhabitants of the steppes have for many centuries led a pastoral life, and have become nomads. They wander about, living in tents during the summer; but in winter they build more permanent homes for the sake of protection against the weather.

Distribution of animals and plants

The kinds of plants and animals are not the same in different sections of the world. Thus, the native animals and plants of Australia are quite different from those of Asia or America. There are several reasons why they do not naturally spread all over the earth. One of the most important of these is that the ocean is in the way. It is a *barrier* that they cannot easily cross. Mountains and deserts are other barriers. Thus, lands that are separated by such barriers are quite apt to have different kinds of animals and plants; while lands that are connected, or that were formerly connected, have animals (*fauna*) and plants (*flora*) more nearly alike. The map shows the different zones of animal life in the world. What are their names?

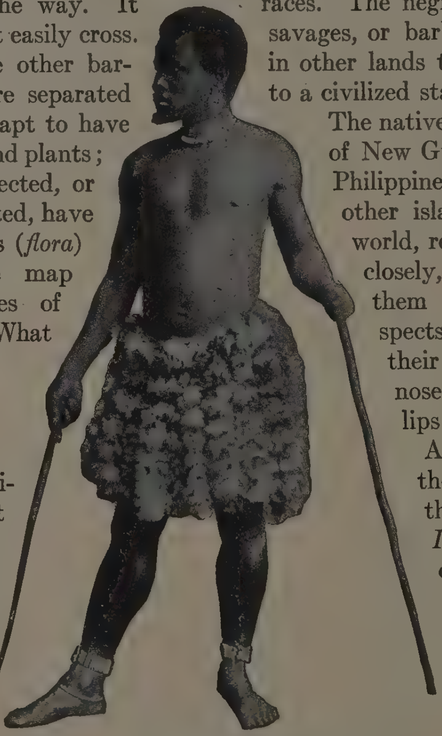


FIG. 248. — A Zulu, one of the tribes of African negroes.

2. Peoples

Man, like plants and animals, varies in different parts of the world. He is influenced by his surroundings, as they are, and in the course of time has developed differently in the various lands of the earth. People hold different views about the *origin* of the human race and its divisions, but mankind in general may be divided into the four great groups described below.

Principal divisions of mankind

1. Ethiopians

All together there are over one and one half billion human beings upon the earth, or nearly twenty times the number in the United States. Of these, over one hundred and eighty-five million are negroes (Fig. 248), or *Ethiopians*. This is often called the black race. There are many divisions of this group, but they all have a deep brown or black skin; short, black, woolly hair; broad, flat noses; and prominent cheek bones.

The home of the Ethiopians is Africa, south of the Sahara Desert, though many have been carried to other lands as slaves, and have there mingled more or less with the other races. The negroes in Africa are either savages, or barbarians of low type; but in other lands they have often advanced to a civilized state.

The native Australians, the Papuans of New Guinea, the Negritos of the Philippines, and the blacks on some other islands in that part of the world, resemble the negroes most closely, though differing from them in some important respects. They are shorter; their hair is less woolly, their noses straighter, and their lips less thick.

2. American Indians

A second great division of the human race is that of the *American Indians*, often called the *red race* (pp. 12–13). It is the smallest of the four groups, numbering only about fifteen million. These people, who in some respects resemble the Mongolians, were in possession of both North and South America when Columbus discovered the New World. They are distinguished by a copper-colored skin, prominent cheek bones, black eyes, and long, coarse, black hair (Figs. 20 and 249).

3. Mongolians

The third division, the *Mongolian*, or *yellow race*, numbers about six hundred and thirty million. They are mainly Asiatic people, though some, like the Finns, Lapps, and Turks, have migrated to Europe.

The Mongolians, as represented by the Chinese and Japanese (Fig. 250), have a yellowish, or in some cases even a white, skin, prominent cheek bones, small oblique eyes, a small nose, and long, coarse, black hair. The Malays are a division of the yellow race. The great majority of Mongolians are civilized, although their kind of civilization differs from that of the white race.

4. Caucasians

By far the largest and most civilized of the four divisions of mankind is the *white*, or *Caucasian, race*, which numbers about six hundred and ninety million. They are also the most widely scattered, being found now in great numbers on all the continents. Their original home is not known.

While they differ greatly from one another, two main branches are recognized: (1) the fair type, with florid complexion, light brown, flaxen, or red hair, blue or gray eyes, and height above the average; (2) the dark type, with fair skin, dark brown or black hair, often wavy or curly, and black eyes.

Extent to which the Caucasians are leaders, with reasons

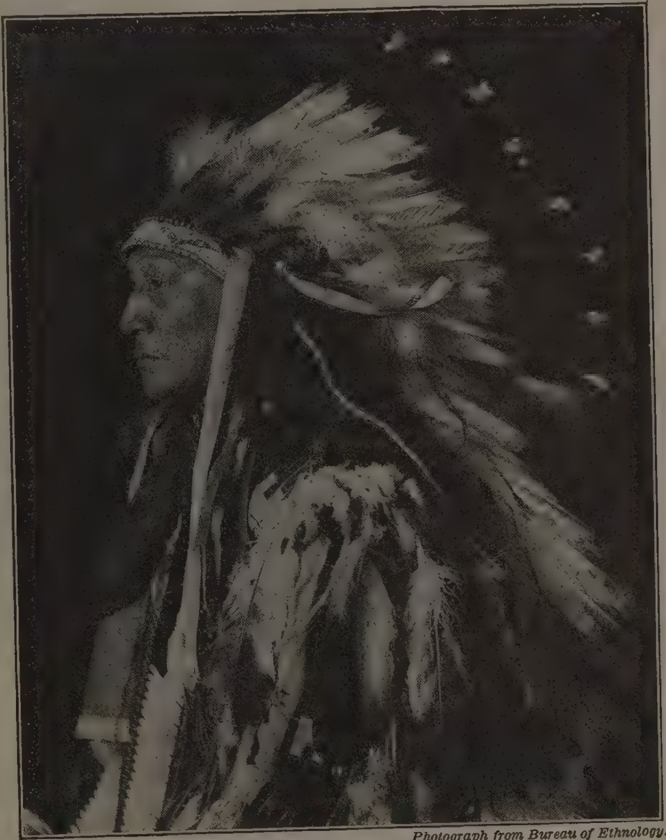
The leaders among these races are the whites, who, having learned the use of ships in exploring distant lands, have spread with great rapidity. Being more advanced than the other races, the white race has conquered the weaker people and taken their lands from them, so that now they rule almost the whole world. The only division that has held out against them is that of the Mongolians, whose very numbers have in large measure served to protect them.

Forms of religion

1. Superstition

Every race has some form of religion. Among ignorant savages it is little more than superstition. They are surrounded by nature, which they do not understand. They seek a cause and, seeing none, are led to believe in spirits. Some of these are supposed to be evil, others good. Believing that these spirits have great influence over their lives, they try to win favor with them by offering sacrifices and worshiping them.

Among the civilized races there are forms of belief in which the idea of God is much higher, and in which the doctrine of future



Photograph from Bureau of Ethnology.

FIG. 249. — A North American Indian; one of the red race.

reward and punishment is taught. Of these religions five call for special mention.

2. Buddhism

Buddhism, followed especially in eastern Asia (Fig. 380), was established in India five or six hundred years before the time of Christ. It was the result of the work and teachings of Buddha.

3. Brahmanism

Brahmanism is one of the most common forms of belief in India and other parts of Asia. It would be difficult to correctly describe the religions of the Asiatic people in a few words; but *idolatry*, or the worship of idols, is common among them.

4. The Jewish religion

The *Jewish* religion, still followed by large numbers of people, upholds the worship of one righteous God as taught in the Old Testament; but they reject the New Testament.

5. Mohammedanism

The prophet Mohammed lived about six centuries after Christ, and the *Koran* contains his teachings. This religion has spread by the sword with wonderful rapidity, especially among the half-civilized people of Asia and Africa.

6. Christianity, and its value

The Christian religion, the common belief in America and most of Europe, has spread far and wide, until it now numbers nearly four hundred and eighty million followers.

FIG. 250. — Japanese women, belonging to the Mongolian or yellow race.

Religious belief has had much to do with inventions and the growth of industry. The Chinese, for example, have long opposed new inventions because their ancestor worship led them to have too much reverence for past customs. Partly for such reasons, our study of geography is chiefly concerned with Christian countries; for there it is that we find the most varied and extensive uses of the earth in the service of man.

Review Questions

1. What are the conditions of plant and animal life in the frigid zone? 2. In the rainy portion of the torrid zone? 3. In the savannas? 4. In the desert portions of the torrid zone? 5. In the well-watered portions of the temperate zones? 6. In the arid lands of the temperate zones? 7. What about the distribution of animals and plants? 8. Tell what you can about the Ethiopians; their characteristics and distribution. 9. Do the same for the American Indians. 10. Mongolians. 11. Caucasians. 12. To what extent are the Caucasians leaders among these races? Give reasons.

Suggestions

1. Make a collection of different kinds of wood. 2. Notice how some of them are polished for use as furniture. 3. Visit a museum to see specimens of tropical animals. 4. Examine a cactus closely. 5. Examine and compare the foliage of some evergreens and deciduous trees. 6. Collect pictures of animals belonging to different parts of the world. 7. How many of the four divisions of mankind are represented in your own neighborhood?

PART III. SOUTH AMERICA

Map study

1. In what zones does South America lie? 2. What climate should you expect in the northern part? In the central part? In the southern part? 3. During what months does winter come in the extreme south? 4. What large rivers drain the continent? 5. Do you find many lakes? Suggest a reason. 6. To what extent is the coast line irregular? 7. Draw an outline map and locate upon it the mountains and rivers. Add the boundary lines of the principal countries. 8. Where are most of the islands? 9. Find Cape Horn. It is south of what island? What strait separates this island from the mainland? 10. Which country has most railways? What does this indicate about the people there? 11. In what zone is that country? How may the climate there have influenced the building of railways?

I. General Facts

Surface features
1. Resemblance between North and South America

Recall the shape of North America. Locate its two main highland masses. What are their names? Which is the higher and more extensive? What about its volcanoes? Where are its principal plains?

As you can see from the map, South America is quite like North America in its surface features. South America, like North America, is triangular in shape, being broad at the north and tapering toward the south. Its principal highlands are on the two sides, as in North America (Fig. 5). The western highlands, called the *Andes* (Fig. 252), form one of the loftiest mountain systems in the world; and between the ranges are many deep valleys and some lofty plateaus, as in our western Cordillera. From the northern to the southern end of South America, those mountains rise from the very seacoast, and extend far inland.

Many of the highest peaks are volcanic cones, one of them, Aconcagua, in Argentina, reaching an elevation of nearly twenty-three thousand feet. This is one of the loftiest peaks in the world. Several of the volcanoes are still active, and some of the eruptions have been terribly violent. Earthquakes, too, are frequently felt in this region.

The most extensive highlands on the eastern side of South America are in eastern Brazil (Fig. 252). Like New England, this is a region of high hills and low mountains. The highest point is a little over ten thousand feet above sea level. The Guiana highland (Fig. 252), between the Amazon and Orinoco rivers, resembles the upland of Brazil, but is separated from it by the Amazon Valley. The remainder of the continent is lowland (Fig. 252), and mainly a vast plain, extending from southern Argentina to the Caribbean Sea.

2. Differences between North and South America

Although the surface features of the two continents are so much alike, there are two important differences. In the first place, their large rivers flow in different directions from those of our continent. Describe the three principal river systems of North America (Fig. 5). Make a sketch of the three largest rivers of South America. One of these is the largest in the world. Which is it? Which one most nearly corresponds to the Mississippi in position and direction of flow?

A second important difference between the two continents is found in the coast lines. It will be remembered that much of the North American coast has been made irregular by the sinking of the land. Thus many good harbors have been formed.

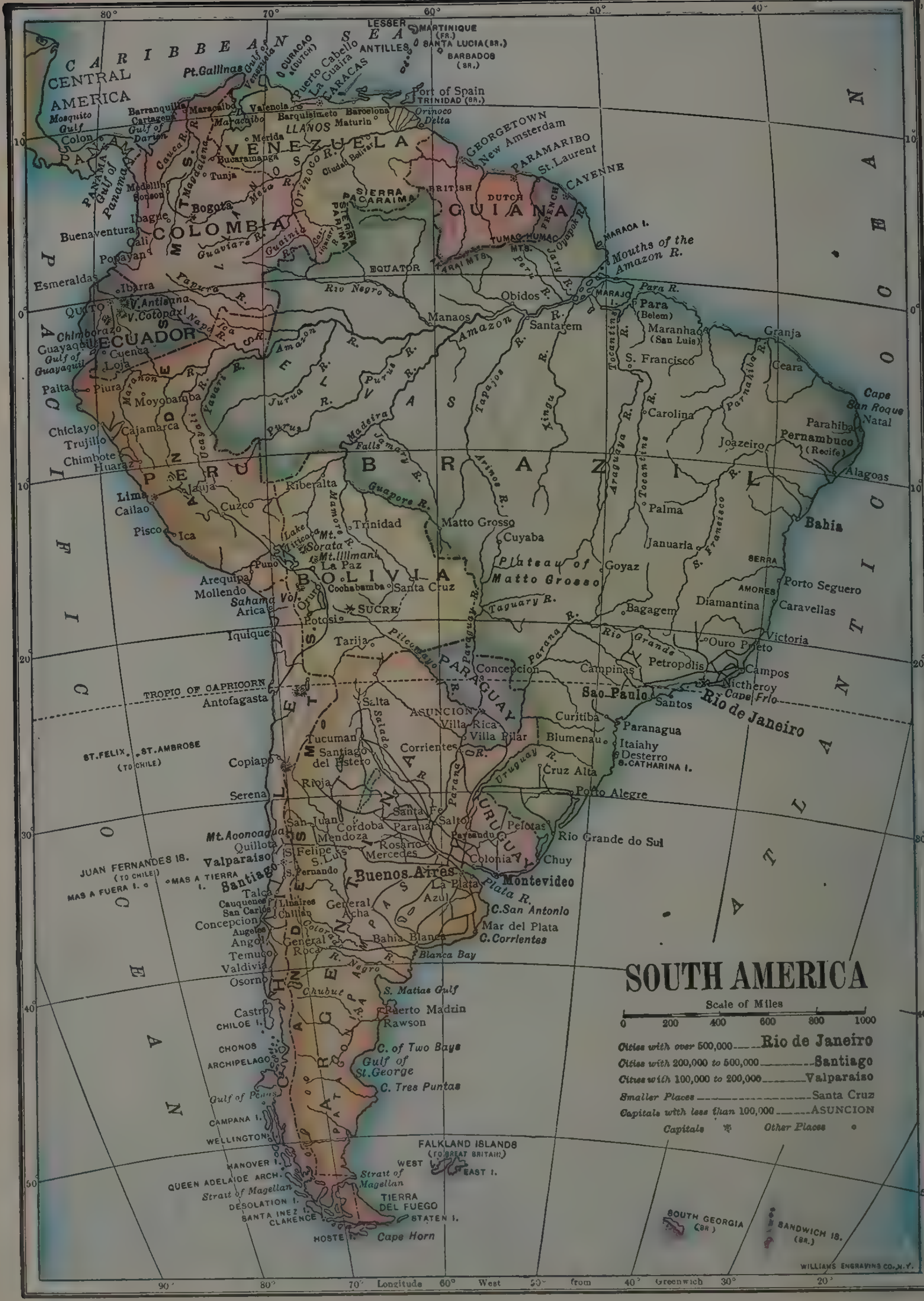


FIG. 251.

The boundary of Ecuador is in dispute.

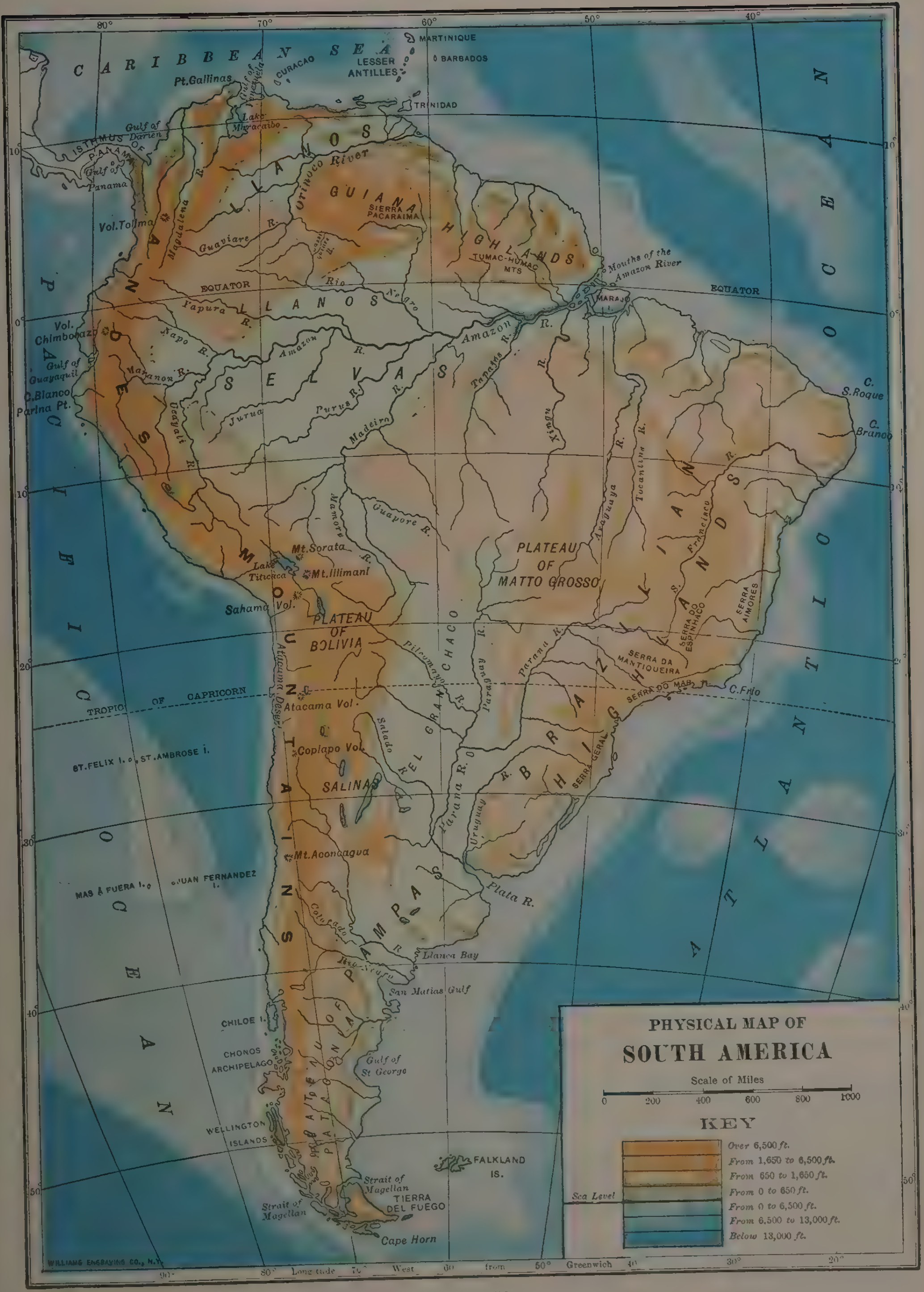

PHYSICAL MAP OF
SOUTH AMERICA
Scale of Miles
0 200 400 600 800 1000
KEY
Over 6,500 ft.
From 1,650 to 6,500 ft.
From 650 to 1,650 ft.
From 0 to 650 ft.
Sea Level
From 0 to 6,500 ft.
From 6,500 to 13,000 ft.
Below 13,000 ft.
CARIBBEAN SEA
MARTINIQUE
BARBADOS
LESSER ANTILLES
CURACAO
TRINIDAD
Pt. Gallinas
Gulf of Venezuela
Lake Maracaibo
Gulf of Darien
ISTHMUS OF PANAMA
Gulf of Panama
LLANOS
Orinoco River
GUIANA HIGHLANDS
SIERRA PACARAIMA
TUMAC-HUMAC MTS
Mouths of the Amazon River
MARAJO
EQUATOR
Vol. Tolima
Magdalena R.
Guaviare R.
Rio Negro
Yapura R.
LLANOS
Vol. Chimborazo
Napo R.
Amazon R.
Maranon R.
Gulf of Guayaquil
C. Blanco
Parina Pt.
SELVAS
Jurua
Purus R.
Ucayali R.
Madeira R.
Tapajos R.
Xingu R.
Tocantins R.
Araguaya R.
C. S. Roque
C. Branco
Mamore R.
Guapore R.
Mt. Sorata
Mt. Illimani
Lake Titicaca
Sahama Vol.
PLATEAU OF MATTO GROSSO
PLATEAU OF BOLIVIA
ANDES MOUNTAINS
BRAZILIAN HIGHLANDS
S. Francisco R.
SERRA DO ESPINHACO
SERRA AIMORES
SERRA DA MANTIQUEIRA
SERRA DO MAR
C. Frio
Pilcomayo R.
GRAN CHACO
Paraguay R.
Parana R.
Atacama Desert
Atacama Vol.
TROPIC OF CAPRICORN
Copiapo Vol.
SALINAS
Salado R.
SERRA GERAL
Uruguay R.
ST. FELIX I.
ST. AMBROSE I.
Mt. Aconcagua
MAS A FUERA I.
JUAN FERNANDEZ I.
PAMPAS
Plata R.
Colorado R.
Llanca Bay
Rio Negro
San Matias Gulf
PATAGONIA
PLATEAU OF PATAGONIA
CHILOE I.
CHONOS ARCHIPELAGO
Gulf of St George
WELLINGTON ISLANDS
FALKLAND IS.
Strait of Magellan
Strait of Magellan
TIERRA DEL FUEGO
Cape Horn
PACIFIC OCEAN
ATLANTIC OCEAN
80° 70° 60° 50° 40°
10° 0° 10° 20° 30° 40° 50°
90° 80° Longitude 70° West 60° from 50° Greenwich 40° 30° 20°
WILLIAMS ENGRAVING CO., N.Y.

FIG. 252.

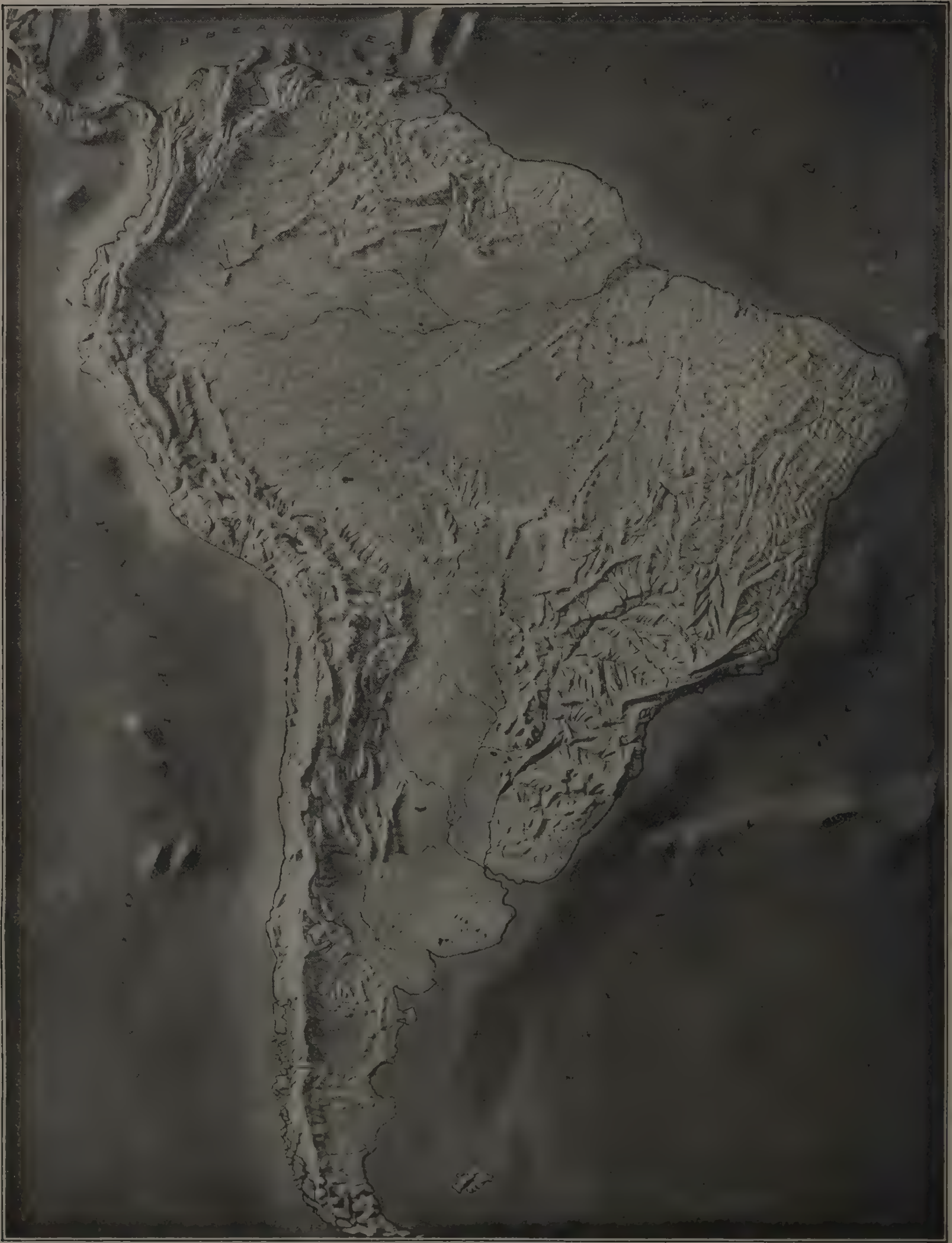


Fig. 253. — Relief map of South America.

Much of the South American coast, on the other hand, has been rising. This has made the coast line straight, because the raised sea bottom is so level. The western coast of South America is the most regular coast, of long extent, in the world. For a distance of three thousand miles there are very few good natural harbors. What effect must this have upon the development of the continent?

What portion of South America has a tropical climate? How do you know?

Climate

1. Temperature

Where does the Tropic of Capricorn cross the continent? What countries of South America are partly or wholly in the temperate zone? During what months do they have summer? What effect on temperature are their north winds likely to have? What part of South America has a climate much like that of the United States?

The winds, together with the highlands, are the key to the rainfall.

2. Rainfall

(1) ***The winds***

On the map it is seen that the belt of calms extends across the continent in the neighborhood of the equator. North of this belt the northeast trade winds blow (Fig. 230), while south of it is the zone of southeast trade winds. Still farther south are the horse latitudes, and then come the prevailing westerlies (Fig. 229), which blow across the southern end of the continent.

(2) ***The rainfall in the tropical zone east of the mountains***

As one would expect, there is heavy rainfall (Fig. 230) in the belt of calms. The northern coast must also receive abundant rains, because the trade winds blow from the ocean and are forced to rise in passing over the slopes. The highlands of eastern Brazil must likewise be well watered by the vapor-laden southeast trades (Fig. 230). The trade winds lose much of their moisture in traveling across the continent, but on approaching the Andes they are forced to a still greater height. Accordingly, the eastern side of this range is wet by frequent rains.

FIG. 254. — A view in the lofty snow-covered Andes.

(3) ***In the tropical zone west of the mountains***

South of the belt of calms, in Peru and northern Chile (Fig. 229), the western slopes and valleys of the Andes are far too arid for agriculture without irrigation, and some portions are true deserts (Fig. 255). This region is arid because the Andes Mountains prevent the trade winds from reaching it. Here the prevailing winds blow from the south; that is, parallel to the coast. For this reason they have little vapor; and since they are blowing *toward* the equator, and therefore becoming warmer, they do not give up their moisture. Thus there are deserts even on the very coast.

Farther south, in Chile, the influence of the prevailing westerlies is felt. In this part of the continent, therefore, it is the

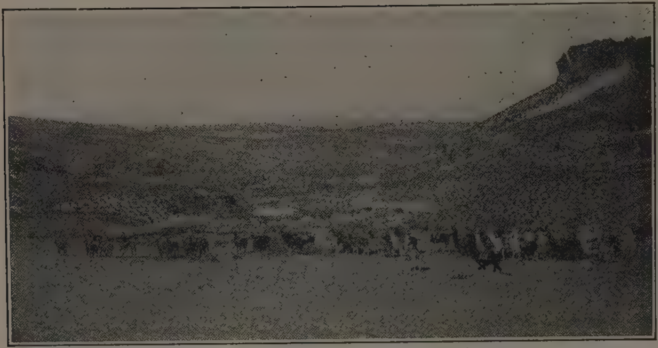


Fig. 255. — A view in the desert of Bolivia in the Andes. The animals are llama.

(4) *In the south temperate zone*

western side that receives the rain, while the eastern part is dry (p. 198). In rising over the land these west winds, from the ocean, cause abundant rainfall in central and southern Chile; but, being robbed of their vapor as they cross the mountains, they descend as dry winds upon the plains of Argentina. With what portion of the United States may the climate of western Argentina be compared?

From the above we see that, while most of South America is well supplied with rain, two extensive areas, on opposite sides of the Andes, are arid. Locate them (Fig. 230).

Plant and animal life

1. Plant life

In the warm, rainy belt the great humidity and high temperature favor luxuriant plant life (Fig. 256). So dense are the vast jungles of the Amazon that travel through them is almost impossible (p. 225), and immense areas have never been explored. In the desert of the west coast, on the other hand, plant life is very scanty. There are some parts — for instance, the Desert of Atacama in northern Chile — where there is almost no life of any kind.

In the south temperate zone, and on many of the mountain slopes of the torrid zone, where the climate is cool, and the rainfall moderate, the land is forest-covered; but these forests are much more open than the tropical jungle. The extreme southern part of the continent has a climate so cold that the plants become dwarfed, as in northern Canada.

2. Animal life

(1) *In the jungle*

In the tropical forest are many insects and beautiful birds. Among the large animals may be mentioned the fruit-eating monkey, the fierce jaguár, which preys upon other animals, and the sloth, a creature which sleeps suspended, back downward, from the branches of the trees. There are also many reptiles, including serpents and the iguana, a tree lizard which grows to a length of several feet. Some of the serpents are small and poisonous; others, like the boa constrictor, are large, and powerful enough to crush a deer in their coils.

The many beautiful butterflies and the ants are especially interesting. The ter-

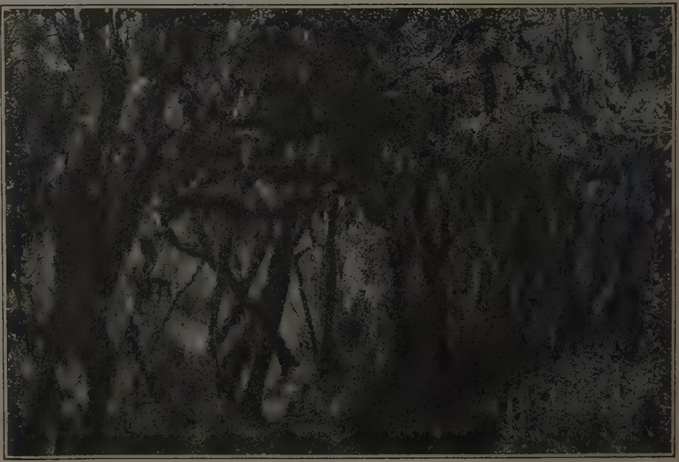


Fig. 256. — A view in the dense jungle of South America.

mites, commonly called white ants, live in colonies, and build houses of earth. With so many insects there are, naturally, numerous kinds of insect eaters. One of the most peculiar of these is the ant-eater. With its long claws it digs the ants from their earthy or woody dwelling places, while its sharp-pointed snout and long tongue aid in finding and devouring its food.

The tapir, a large animal five or six feet in length, wanders about at night, feeding along the water courses. The armadillo, a burrowing animal covered with an armor, rolls itself into a ball when attacked by an enemy, thus protecting its soft under parts. In the river waters and swamps are fishes, turtles, and alligators. The fish and the turtle eggs are among the chief foods of the forest Indians. The manatee, or sea cow, lives in both fresh and salt water, and ascends the Amazon even as far as Ecuador.

(2) *On the plains and among the mountains*

On the grassy plains herds of deer roam about, and also the rhea, — often called the American ostrich, — one of the few large running birds. It lives on the open plains, as in Patagonia, where herds of guanaco, a kind of wild llama, are also found.

Among the crags and peaks of the Andes, dwells the condor, the largest of flying birds, — so large that it kills and carries off small deer. In the mountain valleys live the llama and two related species, the vicuna and alpaca, both wild and domesticated. Like other mountain dwellers, the llama is so sure-footed on the rocks that it is of great use as a beast of burden; and the cold climate causes it to have a thick coat of wool which is of value to man. Because of its usefulness the llama is sometimes called the American camel.

The inhabitants

1. The natives

(1) *Savages and barbarians*

When South America was discovered by Columbus, it was inhabited only by red men. Many of these were savages; and even to-day some of the forest Indians are savages, living almost solely upon fish, game, and the abundant fruits. It is unsafe for white men to go among some of them, and indeed there are forest tribes which are still cannibals.

The red men whom the early explorers found along the eastern coast and some of the larger rivers, were in the lower stages of barbarism like most of the North American Indians. They cultivated the soil in a crude way, and manufactured a few simple implements. Many Indians, in the more remote districts, still live in this primitive fashion, though large numbers have mixed with the white settlers and adopted their customs.

(2) *The Incas*

Among the Andes, especially in Peru, Bolivia, and Ecuador, the Spanish explorers found tribes of Indians, called *Incas*, who had developed far beyond their neighbors. Indeed, like the Pueblo and Aztec Indians of North America (p. 12), they had reached the early stages of civilization. Such advance was favored by the temperate climate of their mountain valley homes, and by the arid country and the mountain barriers, which served to protect them from the inroads of their more savage neighbors.

2. The Spaniards and their influence

The Spaniards, attracted by the discovery of rich deposits of gold and silver, seized almost all of South America, except Brazil, which was settled by the Portuguese. They treated the natives with great cruelty, especially the Incas, whom they robbed of their treasures and reduced to slavery.

As in North America, the Spaniards intermarried freely with the Indians, so that the present inhabitants of South America are, to a large extent, of mixed blood. The introduction of negro slaves has led to a still greater mixture of peoples. Therefore, while there are still pure-blooded Indians and negroes, and also pure-blooded white men, especially Spanish and Portuguese, the greater number of the South Americans are a mixture of two or more of these very different races.

3. Recent immigrants

Of late there have been many immigrants from European countries, especially from Germany and southern Europe. They have gone mainly to southern Brazil, Argentina, and Chile, and have helped greatly in the development of these countries.

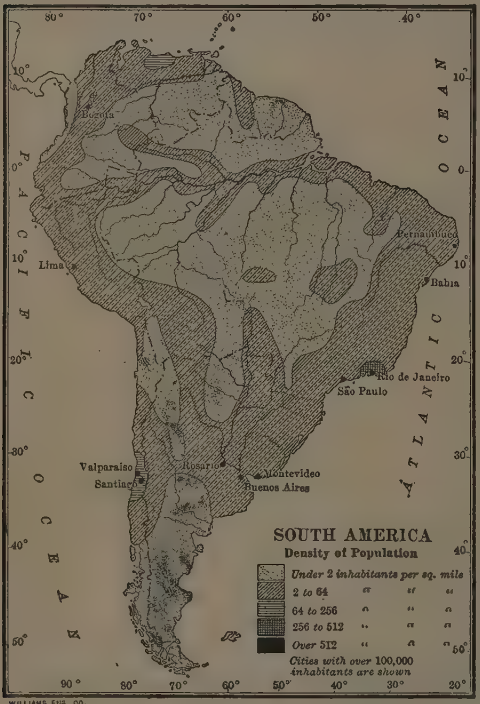


Fig. 257.

Government

Spain maintained her control in South America for fully three hundred years. In the early part of the nineteenth century, however, the colonies became so dissatisfied with Spanish rule that they fought for independence. They were successful and formed independent republics, modeled after the United States. Brazil also became independent of Portugal, and, after being for a long time ruled by an emperor, established a republican form of government in 1889. Every country of South America is now an independent republic except Guiana, which is divided among three European nations, as shown on the map.

II. Brazil

Its extent

This is the largest country in South America. It is even larger than the United States without Alaska, and nearly as large as the whole of Europe. While extending north of the equator on one side, it reaches into the south temperate zone on the other. How many degrees of latitude does it include? 35°

Its climate

Since so large a part of Brazil is on the eastern slope of the continent, in the torrid zone, its climate is not only warm, but moist. Why the latter (p. 198)?

Its drainage

Eastern Brazil is a highland region. Numerous streams drain this upland in various directions. Point out some of them (Fig. 252). What is the name of the largest river not tributary to the Amazon?

The northern third of Brazil is mainly a vast level plain, drained by the Amazon River. The rainfall in the Amazon Valley is so heavy, and the slope of the land so gentle, that the river and its larger tributaries are swollen to great breadth. At times of flood these rivers overflow the surrounding country and change it to an immense swamp crossed by many channels. In some places the Amazon is several miles wide, and resembles a lake rather than a river.

Navigation on the rivers

The Amazon is navigable for steamboats nearly to the base of the Andes, a distance of twenty-two hundred miles from the seacoast. Some of the tributaries also are navigable. Along this waterway there are a few small settlements, such as Mañaos, which are reached by ocean steamers; but away from the river there is nothing but an almost unknown wilderness.

The tropical forest

1. Its appearance

The Amazon forest is a good type of the tropical forest, where plants, encouraged by the heat and dampness, grow luxuriantly in the rich soil. Not only is the rainfall heavy, but evaporation is checked by the dense vegetation, so that the forest reeks with moisture. Therefore, at night, when the temperature falls, such heavy dews collect that the plants are wet, as by a rain.

In these woods there is an occasional giant tree reaching to a height of from one hundred and eighty to two hundred feet, and with a circumference of from twenty to forty feet. The lower limbs may be as much as a hundred feet from the ground. Between these giant trees are smaller ones struggling to rise out of the somber shade into the sunlight. There are also many shrubs, bushes, ferns, and vines, the latter twining about the tree trunks or hanging from the lower limbs (Fig. 258).

The woods present much the same appearance throughout the year. There is no time when all the trees send forth their leaves and blossoms; nor is there a time when all the leaves change color and fall to the ground. Some of the trees blossom throughout the year; others have their blossoms at regular seasons; thus flowers and fruits may be seen at all times of the year.

2. Its products

(1) Fruits, nuts, dyewoods, and vanilla

Some of the trees of the forest produce fruits and nuts, others valuable timber or dyewoods. In fact, the word *Brazil* comes from the name of a dyewood found in the Amazon forests. Another valuable plant is the vanilla, whose beans are of value in making perfumes and flavoring extracts. Many of the Indians near the rivers make long journeys into the forest to collect the products, both for their own use and for shipment down the Amazon.

(2) Mandioca and yerba-mate

The Indians still cultivate the *mandioca*, which was one of their principal foods when white men appeared. The root of this plant is somewhat like a long sweet potato, and a dish of dry meal, or *farina*, made from it is commonly seen on Brazilian tables. To these people mandioca is, in a measure, what wheat is to those who live in temperate climates. It is from this plant that tapioca is made. The leaves of a tropical plant called *yerba-mate*, or Paraguay tea, are also obtained in the Brazilian forest. Brazil produces far more of this than Paraguay.

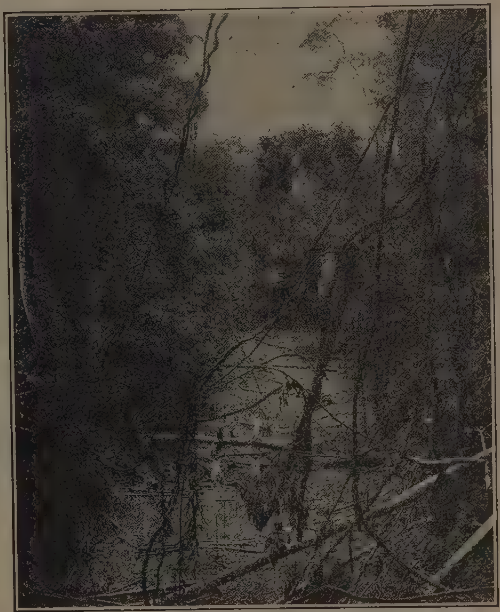


Fig. 258. — Cutting a road in the dense tropical forest of the Amazon Valley. Notice the wavy vines hanging from the trees.

(3) Rubber

The natives are also engaged in obtaining *rubber*, a product of great importance because of its many uses. When gathering rubber, the natives encamp in the forest in lightly built huts from which paths lead through the dense undergrowth to the rubber trees. Holes are made in the trees, so that the sap oozes forth; and it is collected in bamboo dishes. It is then smoked and dried before being shipped down the river to PARA. Find this city on the map (Fig. 251).

Besides the trees in the forest, there are many rubber plantations in which the rubber tree is carefully planted and cultivated. Rubber ranks second among the exports from Brazil, and one of the principal markets for it is the United States. What are some of its important uses?

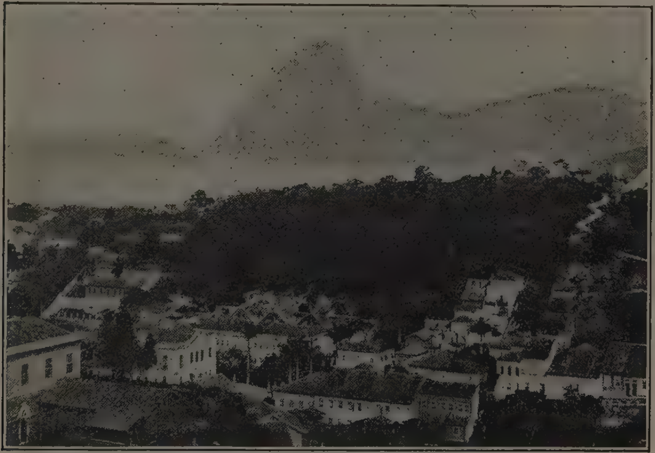


FIG. 259. — A view of part of Rio de Janeiro.

Agriculture
1. Coffee

The coffee tree is a native of Abyssinia in Africa. It was introduced into Brazil long ago, and has proved so valuable that Brazil now produces more than one half of all the coffee used in the world. It is cultivated all the way from southern Brazil to the Amazon, and there are fully five hundred million coffee trees in that country. They grow best at altitudes of from fifteen hundred to forty-five hundred feet, and are therefore very common on the highlands of eastern Brazil. Each tree produces from thirty to forty pounds of coffee a year. Between April and September the berries are picked, dried in the sun, and hulled by machinery.

After being sorted in the cities, the coffee is shipped in bags. Formerly most of the Brazilian coffee left the port of RIO DE JANEIRO; but now more than half of it is sent from SANTOS. Coffee is the principal export of Brazil, and much of it comes to the United States.

2. Other agricultural products

Cotton, sugar, tobacco, fruit, and corn are also raised extensively on the highlands of Brazil. Much cocoa is cultivated in the tropical section, and in the extreme south many cattle are raised.

Mining and manufacturing

The rocks of the highlands produce some valuable minerals, especially gold and diamonds. Indeed, before diamonds were discovered in South Africa, Brazil was the principal diamond-producing country in the world. Both coal and iron are also found, though they are not yet extensively mined.

Manufacturing has begun to be important in Brazil, which is one of the most progressive of the South American countries. Cotton manufacturing is rapidly increasing, and there are also woolen mills, flour mills, and other manufacturing plants, chiefly in southern Brazil. Why should this be the most progressive part of the country?

Principal cities

The capital and largest city in the Republic is RIO DE JANEIRO (Fig. 259), a city with a population of a million people, and the second in size in South America. It is situated upon a fine harbor and is surrounded by an excellent farming country dotted with coffee plantations.

Several other Brazilian cities are seaports, connected with the interior by short railway lines which bring the coffee and other products for shipment. The most important are SÃO PAULO, BAHIA, and PERNAMBUCO, the chief port for the export of sugar and cotton, and SANTOS, the seaport of Sao Paulo.

III. ARGENTINA

Why the most progressive country in South America

This is the most advanced of South American countries. One reason for this is that Argentina extends from just within the torrid zone to the extreme southern end of South America. Thus the country is, for the most part, within the temperate zone, which has the climate most favorable to the development of energetic people.

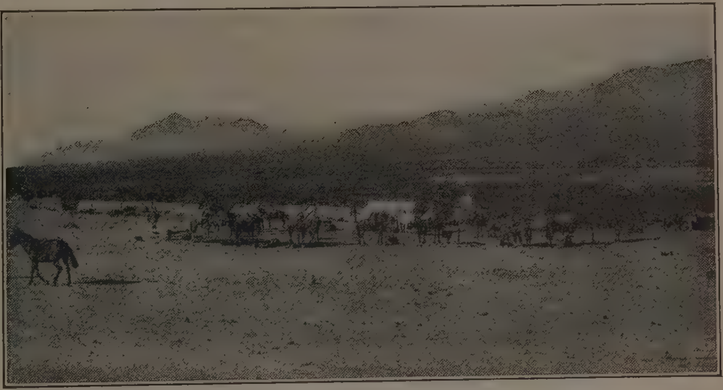


FIG. 260. — A view on a cattle ranch in the pampas of Argentina.

Besides this, there are many different kinds of climate, arid in one part, rainy in another; tropical here, warm temperate there, and cool temperate elsewhere. Such a variety of climate makes it possible to raise a great variety of products.

A third reason for rapid progress is the fact that much of the country consists of *pampas* (Fig. 260). These open, treeless plains have made it easy for settlers to move about and to carry on the industries of farming and ranching. The ease of settlement on these open plains contrasts strikingly with the unfavorable conditions in the dense tropical forest of the Amazon Valley, but may be compared with the conditions on the plains and prairies of the United States.

There are, however, extensive forests in the north, and lofty mountains in the west, and because of these the industries of the country are even more varied.

Such favorable conditions have served to attract many immigrants from Europe, and there is, therefore, a larger proportion of pure-blooded whites here than in other countries of South America. Largely for this reason the government of Argentina is better than that in most South American countries. That, alone, has had much to do with the progress of Argentina.

Agriculture

1. Farming

In many parts of Argentina the climate and soil are favorable to agriculture. In the warm northern portion sugar cane, coffee, and tobacco are produced; in the more temperate part, wherever the rainfall is sufficient, grains and alfalfa are raised. There is also much fruit raising, especially grapes, from which wine and raisins are made.

Wheat is the most important agricultural product, for the humid part of the Argentine plains is one of the greatest wheat-producing sections of the world. The climate is favorable, the soil fertile, and the land level or gently rolling, as in our Red River Valley.

The extreme south is too cold for farming, but sheep raising is carried on even in Patagonia and on the stormy islands beyond the Straits of Magellan.

2. Ranching

The arid, open plains are so well adapted to ranching, that there are many millions of sheep and cattle in this country.

There is some lumbering and mining in the mountainous portion. From the words

Lumbering and mining

Argentina and *Plata,* both of which mean silver, one might conclude that this is a great silver-producing region. This is not so, however, for those names are due merely to the fact that the natives wore silver ornaments. Argentina is not important as a mineral-producing region, though some gold, silver, copper, iron, coal, and petroleum are found.

Manufacturing and commerce

In the large cities there are many industries, largely connected with the raw products of the country. The leading kinds are dairying and the manufacture of wool, flour, sugar, wine, leather, and cotton. A large portion of the raw products, however, is sent abroad, particularly wool, hides, wheat, corn, and meat. Machinery and many other manufactured articles must still be imported.

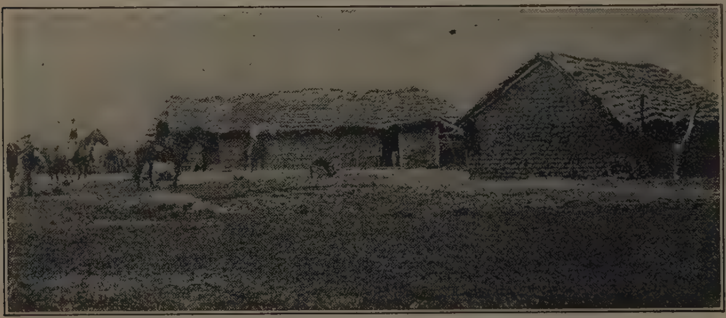


Fig. 261. — A ranch house on a cattle ranch in Uruguay.

In a country so progressive as this, it is natural that there should be means of ready transportation. The broad Parana River, which empties into the Plata Estuary, forms an important waterway to the interior; and railways cross the well-settled portions of the country, connecting all the important cities. In fact, there are more railways here than in any other South American country. In resources, industries, government, and education, Argentina, of all the South American countries, most closely resembles the United States.

Principal cities

By far the most important city is BUENOS AIRES. With over a million inhabitants, it is the largest city in South America, and one of the great cities of the world. It is growing rapidly and has much manufacturing and commerce.

Just below Buenos Aires, on the Plata Estuary, is the seaport of LA PLATA; and upstream, on the Parana River, is the rapidly growing city of ROSARIO, which is an important railway center as well as a river port. In the interior are a number of towns and cities, among which CORDOBA is one of the largest.

IV. URUGUAY AND PARAGUAY

Uruguay

Like so much of Argentina, this is a region of plains, and since a large part of the country is well watered, it is suited to the production of the same crops as northern Argentina. But there has been much less development in Uruguay than in Argentina. One reason is that it has been very badly governed, for a few men have often controlled the army and made and unmade presidents almost at will.

In late years there has been great improvement, and agriculture is being extended, — such crops as wheat and other grains, tobacco, and fruits being important products. Cattle and sheep are, however, of even greater importance.

The principal manufactured products and exports are those connected with cattle and sheep; namely, dried beef, corned beef, ox tongues, hides, tallow, horns, and wool. The capital and largest city is the seaport, MONTEVIDEO, on the Plata Estuary.

Paraguay

This little country, like Bolivia, is without a seacoast, though it is connected with the sea by the Parana River. It is a region of hills and plains, partly covered with forests, but with much pasture land upon which large herds of cattle feed. The climate is hot and in many parts dry, with most of the hot winds from the north.

The agricultural products, besides cattle, are those of the warm temperate and tropical zones. These include tobacco, rice, sugar cane, and oranges. Rubber, dyewoods, and valuable timber are obtained from the forests. Another product is *yerba-mate,* or *Paraguay tea.* Although not used so extensively as our tea, which comes mainly from Asia, the Paraguay tea is very popular in South America, where its use was learned from the red men.

The capital, ASUNCION, is connected with Argentina, Uruguay, and the seacoast by rail.

V. THE GUIANAS AND VENEZUELA

The Guianas

North of Brazil are three small countries, the only portions of the South American continent now under control of European nations. They belong to Great Britain, Holland, and France, respectively, and are known as *British Guiana, Dutch Guiana,* or *Surinam,* and *French Guiana.* Find the capital of each.

In these countries a large part of the surface is still a forest wilderness, inhabited chiefly by Indians. This tropical forest, like that of the Amazon, which it closely resembles, supplies rubber and valuable timber; but its resources are only slightly developed. Near the coast there is a strip of cultivated land on which sugar cane, bananas, cotton, and a few other products are raised. Of late, especially in Dutch Guiana, attention has been turned to the production of cocoa and coffee. Some gold is found in each of the Guianas. The Guianas have but one short railway, and in most sections there are almost no roads. There are scarcely any exports except sugar, molasses, and rum — all made from sugar cane.

Venezuela

1. Character of country, and products

This name, which means "little Venice," was given in 1499 because the explorers found an Indian village built on piles, or posts, in the water along the shore of Lake Maracaibo.

Venezuela includes one of the spurs of the Andes, and also a portion of the Guiana highland; but a large part of the country is occupied by the broad plains of the Orinoco Valley. Some of these plains, the treeless *llanos* (p. 211), are the seat of extensive cattle raising, as is the case on the pampas of Argentina. There is some farming. Hardy crops, like potatoes, beans, and barley, are raised even at altitudes of eight thousand feet; but below five thousand feet are found such semitropical and tropical products as sugar cane, bananas, cocoa, and coffee. Coffee is the chief export; in fact, Venezuela is one of the leading coffee-producing sections of South America.

In parts of Venezuela there are vasts forests which produce valuable dyewoods and rubber; and among the mountains are rich mineral deposits, especially gold.

2. Chief city

The capital, CARACAS, five or six miles from the sea, is situated upon a plateau, over three thousand feet above sea level. It is connected with its seaports by a short railway.

VI. TROPICAL ANDEAN COUNTRIES

Resemblances to one another

1. In surface

These countries — Colombia, Ecuador, Peru, and Bolivia — are all crossed by the lofty Andes, and are therefore very mountainous. Each of them extends eastward, beyond the mountains, to the plains of the upper

FIG. 262. — Tropical foliage on the lowlands of Ecuador near the coast.

Amazon and Orinoco valleys. The headwaters of the Amazon and its tributaries, in the region of the equator, have never been fully explored, and for that reason the exact boundaries of these countries of this section have been in dispute.

2. In variety of climate and of farm products

In such a mountainous country, there is, of course, great variety of climate. Tropical heat prevails throughout the lowlands; but on the mountain slopes there are temperate and even frigid climates.

The farm products vary accordingly. Up to an elevation of three thousand to four thousand feet, bananas, sugar cane, cocoa, and other plants of hot climates flourish. Above this, to an elevation of six or seven thousand feet, tobacco, corn, and coffee are cultivated. From this height up to about ten thousand feet, wheat and our Northern vegetables and fruits do well; but above ten thousand feet the bleak mountain peaks are too cold for farming.

There is a great difference in the rainfall, as well as in temperature. Near the equator the rainfall is heavy; but in southern Peru, which lies in the belt of the southeast trade winds (p. 198), the climate is arid. On this account the tropical forest gradually dwindles toward the south, being replaced first by arid plains, and then by deserts.

3. In abundance of minerals

The fact that this section is so mountainous explains its importance as a mineral region. Gold and silver ores, and other minerals as well, are found from the northern to the southern limit of the Andes, and this is one of the great mineral-producing regions of the world.

4. In location of chief cities

None of the capitals of the Andean countries is on the coast, and several are in the interior at a considerable elevation above sea level. Find examples. In choosing such sites the inhabitants have had the example set them both by their Spanish ancestors and by the Incas; for Cuzco, the capital of the Incas, and Madrid, the Spanish capital, are both at a considerable elevation above sea level, and many miles from the coast. The principal objects in the selection of such sites were to be near the mines, to secure a cooler and more healthful climate, and to obtain protection from attack by sea. Doubtless the absence of good harbors (p. 221) was another reason why these capitals were not located on the coast.

It has been very difficult to carry on a republican government in these countries, where a large part of the population can neither read nor write, and where there are so many Indians and half-breeds.

5. Government

In each of them ambitious leaders, usually generals in the army, have again and again overturned the government. This has greatly interfered with the development of industry and commerce; for neither life nor property has been safe. It has also prevented settlers from coming. Of late, however, there has been great improvement.

Colombia

Colombia, named after Columbus, has seacoast on both oceans. The western part is very mountainous, for several of the Andean ranges terminate there. Much mineral is found here, gold and silver being most important, though emeralds of excellent grade are also obtained.

In the eastern portion, on the other hand, are treeless llanos on which large numbers of cattle are raised, as in Venezuela. Coffee is the principal farm product and the chief export; but sugar cane, tobacco, and cocoa are also produced. On the mountain slopes the grains, fruits, and vegetables of temperate climates are grown.

Bogota, the capital and largest city, is situated far in the interior, at an elevation of about a mile and a half above sea level. It has an agreeable climate, even though within the tropical zone.

Panama

The small republic of Panama was formerly a part of Colombia, but it revolted and became an independent country a few years ago. What have you learned about it (p. 163)? What can you tell about the Panama Canal zone (p. 141)?

Ecuador

Why should Ecuador, the Spanish word for *equator*, be given to this country? In the Andes of Ecuador there are many volcanoes, including Cotopaxi, the loftiest active volcano in the world, and Chimborazo, which is still higher, though no longer active. Describe the climate.

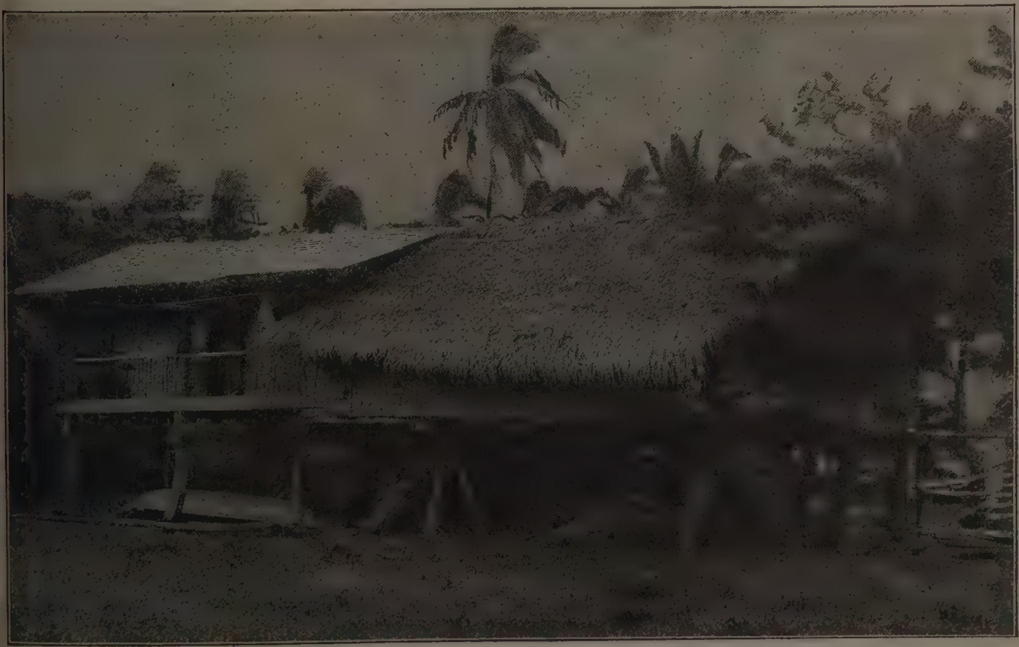


Fig. 263. — A house in Ecuador raised above the ground because of the dampness.

The principal occupations are farming and cattle raising. The chief farm products are wheat and barley on the highlands, and coffee, sugar cane, and *cocoa* on the lowlands. Cocoa is the most important product of Ecuador, and fully one sixth of all that is produced in the world comes from here.

Fig. 264. — An Inca Indian of Peru.

The cocoa tree, which grows in the shade of the larger forest trees, has small pink and yellow blossoms which spring directly from the main trunk and branches. Its leaves are always green and it blossoms throughout the year. From each blossom there develops a golden-colored pod, several inches in length, inclosing a number of seeds, or beans, which are about the size of a large almond. After being washed, dried, and roasted, the beans are ready to be made into cocoa and chocolate. What are some of their uses? By what routes might they be shipped from Guayaquil to New York?

Another product of Ecuador, and of some other South American countries, is *sarsaparilla*. The rubber industry is also well developed.

There is an almost total absence of roads in this country, making the transportation of heavy machinery very difficult. This fact interferes greatly with mining among the mountains. Therefore, although there are known to be many minerals, there is little mining, except of the richest gold deposits. There is almost no manufacturing in the country.

Guayaquil, the seaport and the westernmost of the large cities of South America, is first in size. It is in W. Long. 80°. Does it lie east or west of Washington, D.C.? Quito, the capital and the second city in size, is situated among the mountains of the interior at an elevation of about nine thousand feet.

Peru

1. Climate

There is abundant rainfall in northern Peru and on the eastern side of the Andes; but in southern Peru the climate is arid and there are deserts (Fig. 230). Recall the cause of this arid climate (p. 198). So little rain falls in southwestern Peru that in some parts, even close by the sea, there is an average of but one shower in seven years.

2. Mining

Peru was one of the most valuable sources of gold and silver for the Spanish conquerors. The Incas, who dwelt there, had collected gold for ornaments, and this the Spaniards seized. Then, open-

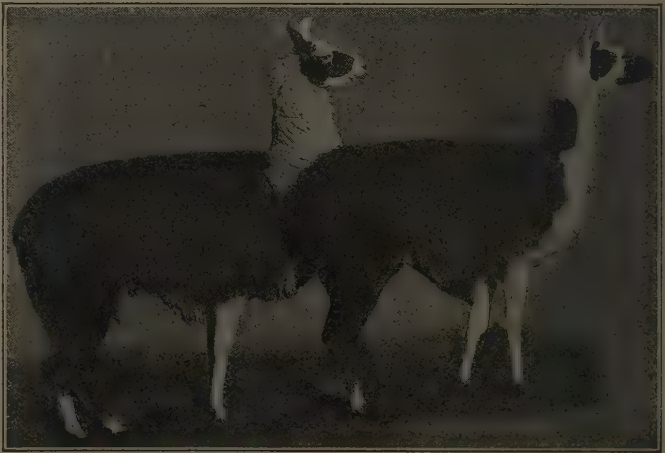


Fig. 265. — The South American llama.

ing mines, they forced the Indians to work in them as slaves. Since that time vast quantities of gold and silver have been obtained in this country; and valuable deposits of coal, petroleum, and copper have also been found.

3. Agriculture

There is much agriculture in Peru, the principal crops being corn, wheat, and potatoes among the mountains, and sugar cane, cotton, tobacco, cocoa, and coffee in the lower and warmer sections. Even in the desert portion there is some farming by irrigation, as in Southern California. Large numbers of sheep and cattle are raised, and also the llama and alpaca for their wool (Fig. 265).

An unusual product is *coca*, from which *cocaine* is made; and another is *cinchona*, or *Peruvian bark*, from which *quinine* is made. These plants were cultivated by the Incas before the coming of the Spaniards.

4. Manufacturing and transportation

There is some manufacturing in Peru, especially of sugar and cotton goods. One great difficulty, however, has been that of transportation. The rugged Andes extend the entire length of the country, separating the Pacific coast from the broad, forest-covered plains of eastern Peru. To overcome this difficulty, the Peruvians have built several railways, one of which deserves special mention. Beginning at Callao this line passes through Lima; then it climbs the mountains, crossing deep gorges, by means of high trestles, winding about on the very edge of precipices, tunneling through the mountain rock, and finally crossing the western range of the Andes at an elevation of over fifteen thousand feet.

5. Chief cities

Lima, the capital (Fig. 266), founded by the Spanish conquerors in 1535, is situated at the base of the Andes. Callao, the seaport of Lima, is about seven miles from the capital. Its harbor is but little more than an open roadstead partly protected by an island on the southwest side. However, since the winds and ocean swells are *from the south*, while the coast is seldom visited by storms, this slight protection is sufficient.

Arequipa, at an elevation of seven thousand feet, is separated from the sea by sixty miles of desert. Cuzco is on an interior table-land, at an elevation of over eleven thousand feet. The ruins of the Inca citadels and "palaces" are still to be seen, and many pure-blooded and half-breed Incas still dwell in and near this ancient capital.

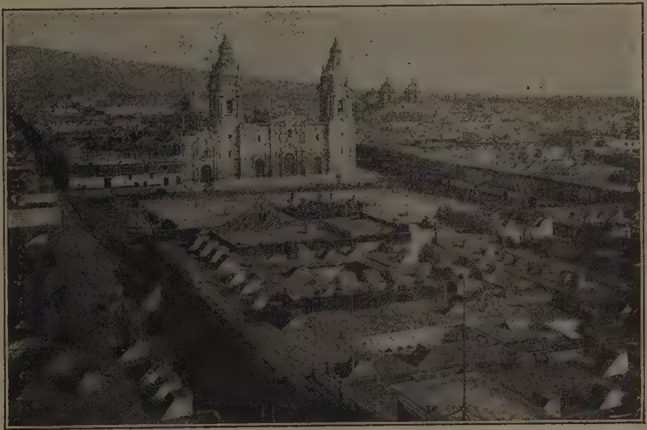


Fig. 266. — A view of Lima, the capital of Peru.

Bolivia

This country, named after General Bolivar, the great South American leader in the revolt against Spain, was robbed of its seacoast by Chile. Its surface is mountainous, with broad and very high plateaus between the mountain ranges. In one of these valleys lies Lake Titicaca, partly in Peru and partly in Bolivia. This lake, the greatest in South America, is about a third the size of Lake Erie. It is the most elevated great lake in the world, lying over twelve thousand feet above the sea.

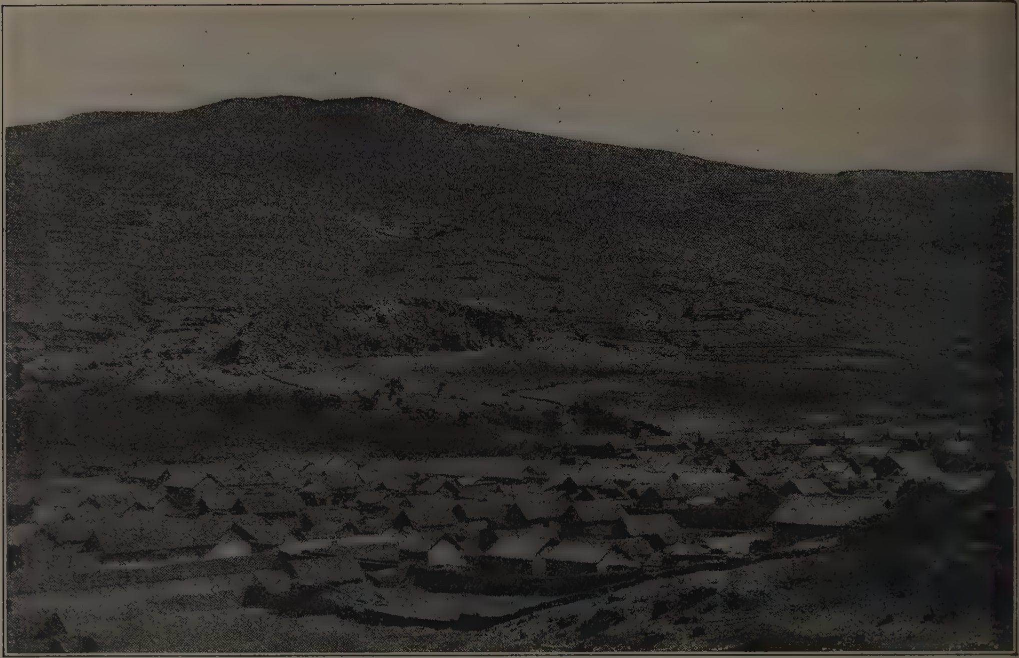


Fig. 267. — La Paz, the largest city of Bolivia, situated in an arid valley among the lofty Andes.

The Incas occupied this region also, and mined much gold. Besides gold, the Spanish discovered veins of copper, tin, and silver, so that mining has been one of the most important industries of the country. It is said that over three billion dollars' worth of silver has been mined in Bolivia since the Spaniards first visited the country.

VII. Chile

Surface features

The eastern boundary of Chile is the divide between the Atlantic and Pacific drainage; and since this runs along the Andes, the country is very mountainous, and narrow in an east and west direction. Measure its length; its width. Except in the south, the coast line is regular, like that of the rest of South America.

Climate

The climate varies more than that of any other South American country. The northern part is within the torrid zone, while the southern end reaches far into the bleak south temperate zone; and on the mountain slopes there is every climate, from torrid to frigid. The very name, Chile, is derived from an Indian word for snow.

There is also great difference in rainfall; for northern Chile is arid, and in some portions an absolute desert; while central and southern Chile reach into the rainy belt. The best developed section of the country lies in the middle part, between the hot, arid north and the bleak, rainy south.

Mining

There is much mineral wealth, including gold, silver, coal, and copper. Of these copper is one of the most valuable minerals, and Chile, like the United States, is one of the great copper-producing countries of the world. Even more important than the copper are the beds of nitrate of soda, which yield many million dollars' worth of nitrate every year. This substance is one of the chief exports.

The nitrate beds lie in the midst of the Desert of Atacama, in which rain seldom falls. The substance occurs in layers from a few inches to one or two feet in thickness, over an area thirty or forty miles in breadth. After being dug out, the pure nitrate is dissolved and separated from its impurities, and then sold. Its chief use is as a fertilizer, for which purpose large quantities are shipped from the port of IQUIQUE.

Agriculture

Agriculture is extensively carried on in Chile, especially in the rainy middle portion; as in many parts of the United States. The principal crops are the various grains, tobacco, fruits, and vegetables. More wheat and barley are produced than are needed at home, so that Chile helps to supply other nations with these grains. Large herds of cattle are reared; and sheep raising is one of the chief industries in southern Chile. Hides, leather, and wool are exported.

Manufacturing

There is more manufacturing than in most South American countries, the principal kinds being flour milling, cheese making, tanning, and shoemaking. Manufacturing is rapidly increasing, but, as in other South American countries, it is still necessary to import from Europe and the United States much of the machinery and other manufactured articles used.

Progress of the country

Chile is one of the most progressive nations in South America. Its government is good, and its industries are well developed. This progress is doubtless in large part due to the temperate climate, which requires energy on the part of its inhabitants, and invites settlers from the temperate climate of Europe. It is interesting to note that the two most advanced nations of South America lie side by side in the temperate zone, while the next most progressive country, Brazil, is partly in that zone.

The principal cities of Chile are SAN-

FIG. 268. — The shipping in Valparaiso harbor.

Chief cities

TIAGO, the capital and largest city, situated inland, and VALPARAISO, its seaport (Fig. 268). The harbor of Valparaiso, like that of Callao (p. 233), is open to the north; but the wind seldom blows from that quarter.

VIII. Islands near the Continent

On the north side

Just off the coast of Venezuela, opposite the mouth of the Orinoco, is the low island of *Trinidad*, a British possession. This island is especially noted for its pitch lake, from which asphaltum is obtained for use in making asphalt pavements. The asphaltum oozes slowly from the ground; and, as it is dug out, more takes its place, showing that there is a very large supply beneath the surface.

On the west

West of Chile, and belonging to that country, is the island of *Juan Fernandez*. This is the island where Selkirk was wrecked, and by some is thought to be the island home of Robinson Crusoe. It seems quite certain, however, that Defoe described Tobago, just north of Trinidad, instead of Juan Fernandez.

Review Questions

1. What striking resemblances in surface features are there between North and South America? 2. What differences? 3. Show how the temperature varies from place to place. 4. The rainfall. 5. Describe the plant and animal life. 6. What can you tell about the native inhabitants? 7. The Spaniards and recent immigrants? 8. What can you tell about the government? 9. Compare Brazil with the United States in area. 10. What about its climate and drainage? 11. Navigation on its rivers? 12. Describe the tropical forest. 13. What valuable products are obtained there? 14. What are the agricultural products of Brazil? 15. What is the condition of mining? Of manufacturing? 16. Name and locate the principal cities. 17. Give some reasons why Argentina is the most progressive country of South America. 18. What about its agriculture? 19. Lumbering and mining? 20. Manufacturing and commerce? 21. Name and locate its principal cities. 22. Give one reason for the slower development of Uruguay. 23. What are its products? 24. Name and locate its chief city. 25. What kind of country is Paraguay? Tell about its products and chief city. 26. Name the Guianas. What about their products and commerce? 27. What are the surface features of Venezuela? 28. What are its products? 29. Locate the chief city. 30. How do the tropical Andean countries resemble one another in surface features? 31. In variety of climate and of farm products? 32. In abundance of minerals? 33. In location of principal cities? 34. In character of their government? 35. What about the surface features and the products of Colombia? 36. What is its leading city? 37. Describe the surface and climate of Ecuador. 38. What are its agricultural products? 39. What about mining and manufacturing? 40. Name and locate the principal cities of Ecuador. 41. What climate has Peru? 42. What about mining there? 43. Agriculture? 44. Manufacturing and transportation? 45. Name and locate its chief cities. 46. Describe the surface features of Bolivia. 47. Tell about mining in that country. 48. Describe the surface of Chile. 49. The climate. 50. What about mining there? 51. Agriculture? 52. Manufacturing? 53. Why has Chile made such progress? 54. Locate the chief cities. 55. Name, locate, and tell the principal facts about the islands near South America.

Comparisons with North America

1. Which of the two Americas has the advantage in regard to latitude? Show how. 2. Tell about the effects of the trade winds in each continent (Fig. 230). 3. Of the prevailing westerlies (Figs. 233 and 234). 4. Locate the arid sections in each continent, and give the reasons for the lack of rain (Figs. 230, 231). 5. Point out the rainiest section in each, and state the causes. 6. Which of the two continents has the better position for world commerce? Why? 7. Into what ocean do the principal rivers of South America flow? Of North America? 8. What can you say about the regularity of the coast of the two continents? Which has the advantage in this respect? How? 9. Locate the five principal coast cities of South America; of North America. State the main advantages of the location in each case. 10. What about the number of lakes in each continent and their value for commerce? 11. What about the number of large cities in the interior of each continent? 12. Compare both Brazil and Argentina with the United States in area; in population. 13. Compare Chile with Texas in these two respects. 14. Make a list of the important farm products common to South America and the United States. 15. Name some products that are extensively raised in one and not in the other.

16. Which parts of each continent are especially noted for cotton? Coffee? Wheat? Cattle and sheep? Copper? Precious metals? 17. What is the prevailing kind of government in North and in South America? What sections have a different kind of government?

Suggestions

1. Give several reasons why South America has been much less rapidly settled than North America. 2. How does the Spaniards' treatment of the Incas compare with their treatment of the North American Indians? 3. Find out some of the ways in which coffee is often adulterated. 4. Make a drawing of South America; a sand model. 5. If you were expecting to emigrate there, in what country should you prefer to settle? Why? 6. What products of South America are you probably seeing and using from week to week? 7. Is Brazil likely to rival the United States in importance in the future? Why? 8. Is it an advantage or disadvantage for South America that it is divided into so many more countries than North America? Why?

PART IV. EUROPE

Map study

1. On the map (Fig. 351) trace the boundary between Europe and Asia. 2. What peninsulas are there? 3. What countries are wholly or partly on peninsulas? 4. How does Russia compare in area with the other countries of Europe? With the United States? (See Appendix, pp. 390–392.) 5. Where are the principal mountains? 6. Name and locate the principal rivers. 7. The 40th parallel of latitude crosses what countries of Europe? Through or near what cities in the United States does it pass?

I. General Facts

Why called a continent

The continent of Europe was named when only the southern part of it was known. As people learned more about it, they found that Europe was connected with Asia, being, in fact, a great peninsula extending westward. We now know that Europe and Asia together really form a single continent, which is called *Eurasia*. But since Europe has been long considered a separate continent, and has been so important as the home of the civilized races, it is still the custom to class it as a continent.

Story of the continent

1. Formation of mountains in the northwest

As in the case of North America, the growth of the continent of Europe has required millions of years. Far back in time mountains appeared above the sea in several places, as in the northwestern portion of the continent. Although greatly worn away, these mountains may still be seen in Finland, Scandinavia, and Scotland (Figs. 272 and 273), as well as in Germany, Belgium, and other sections. They resemble the mountains of New England and eastern Canada.

2. Later mountain ranges, and their direction

Other mountain ranges were formed in southern Europe; but, like those of western America, they are younger and are far less worn away than the older mountains mentioned. Therefore the *Pyrenees* (Fig. 295), *Alps* (Fig. 328), and *Caucasus* (Fig. 269) mountains are still of great height. Find each on Figure 272. Besides the mountains named, there is a long, low chain, known as the *Urals*, which extends north and south along the eastern boundary of Europe. Other highlands are shown on Figure 273. Where are they mainly situated?

The highest mountains in Europe are in the south, and they extend in various directions, though mainly east and west. How does this arrangement promise to affect the climate? Next to the Caucasus (Fig. 269), the loftiest of all are the Alps (Figs. 328, 332). The rains and snows of the Alps find their way to the sea through several of the large rivers of Europe. What are the names of the largest (Fig. 272)? Headwaters of four of them — the Po, Rhone, Rhine, and Danube — are within forty miles of one another in the Alps.

Europe owes much of its very irregular outline to the fact that the mountains are not continuous, and consist of chains extending in various directions. How does Europe compare with North America in this respect? With South America?

3. The low plain between these mountains

Between the mountains of the northwest, the east, and the south there is an extensive lowland (Fig. 273). A part of this has been lowered beneath the sea by the sinking of the land, thus forming the shallow Baltic Sea. This plain extends from southern England, through Belgium and Holland, or the "Low Countries," entirely

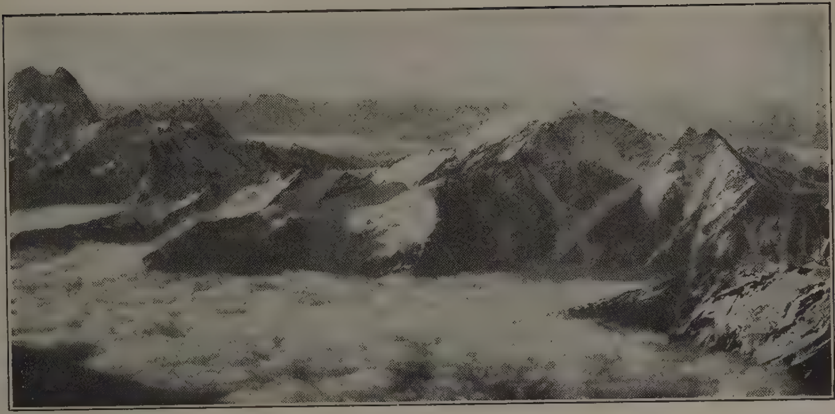


FIG. 269. — A view over the crests of the lofty snow-covered Caucasus Mountains. The valley in the front is filled with clouds.

across Germany and Russia (Fig. 273). It broadens toward the east until it includes almost all of Russia. Estimate its length from east to west. About two thirds of Europe is included in this plain.

4. Formation of coal beds; also kinds of coal

While the mountains and plains were being made, coal beds were also forming, as was the case in America during the *Coal Period*. State once more how coal was formed. Most of the coal is *bituminous*, though there is some *anthracite*. In a number of sections *lignite*, or brown coal, is mined; and *peat* is also dug for fuel in western Europe.

5. The great Ice Age

At the same period that eastern North America was invaded by a great ice sheet from the north, snow

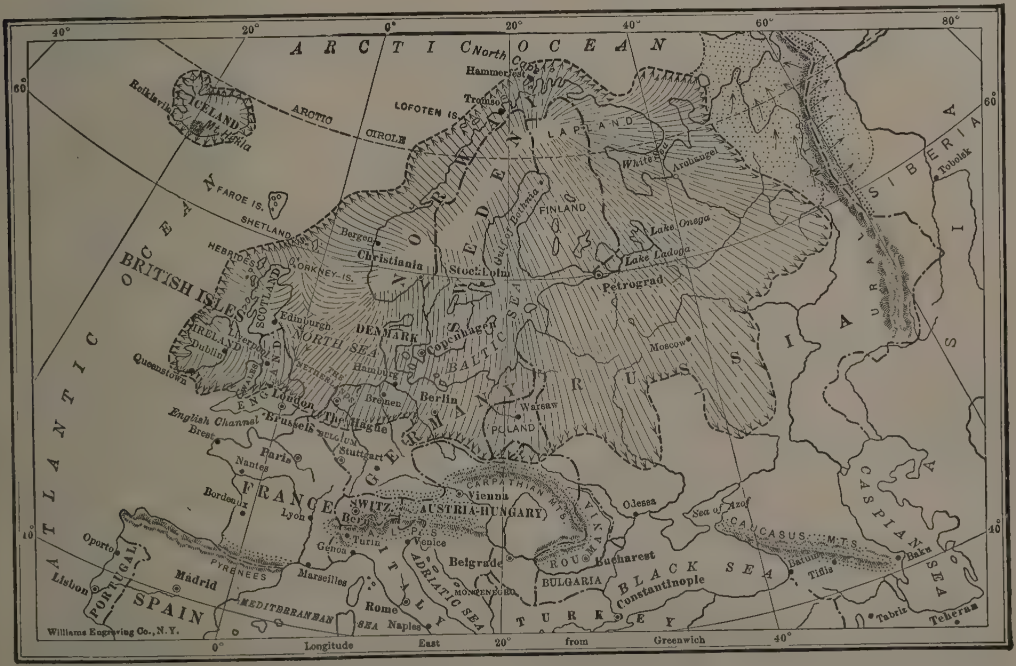


FIG. 270. — The ice sheet of Europe.

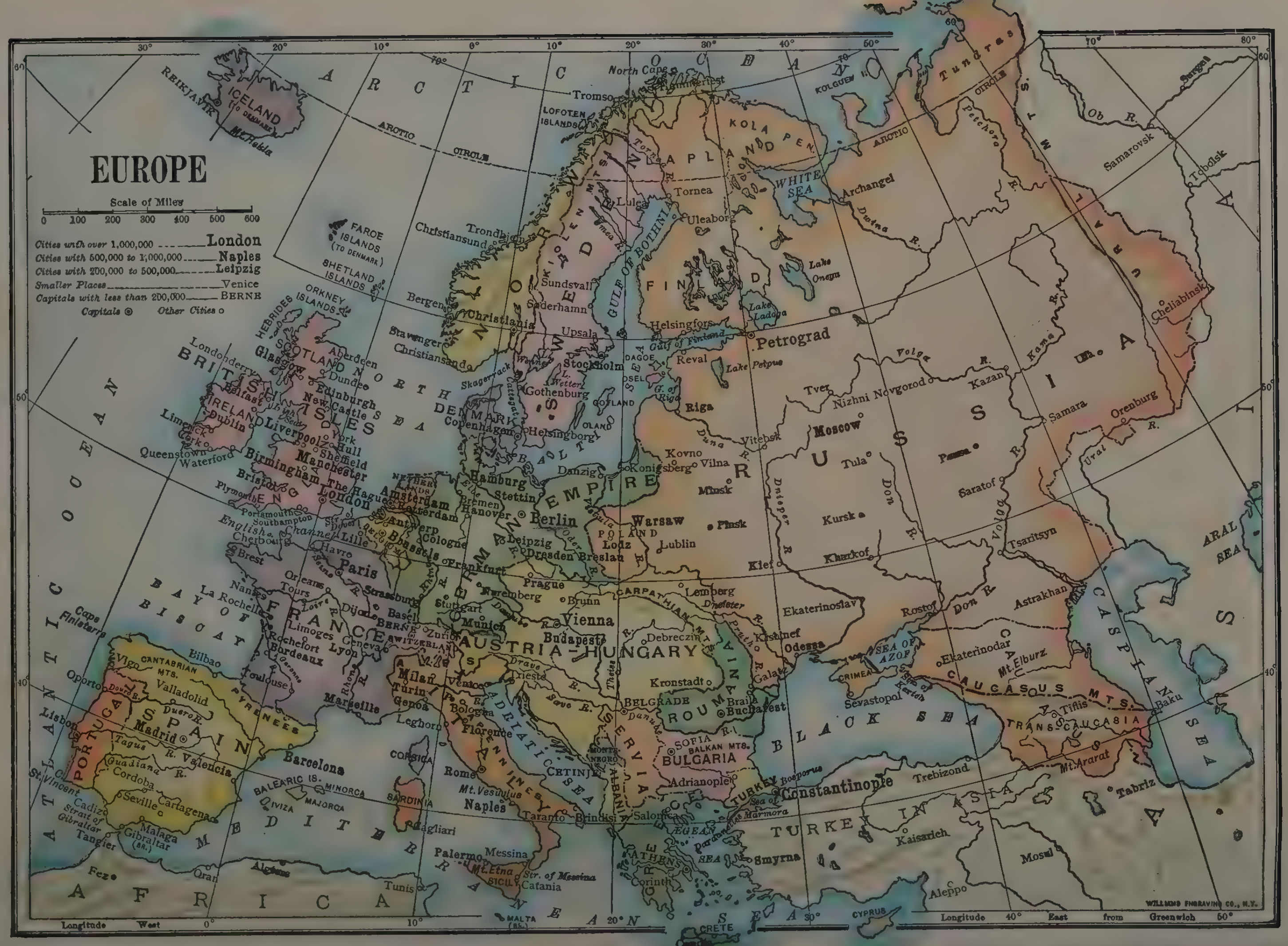

EUROPE
Scale of Miles
0 100 200 300 400 500 600
Cities with over 1,000,000 London
Cities with 500,000 to 1,000,000 Naples
Cities with 200,000 to 500,000 Leipzig
Smaller Places Venice
Capitals with less than 200,000 BERNE
Capitals ◎ Other Cities ○
ARCTIC OCEAN
ARCTIC CIRCLE
ATLANTIC OCEAN
NORTH SEA
BALTIC SEA
BAY OF BISCAY
MEDITERRANEAN SEA
BLACK SEA
CASPIAN SEA
ARAL SEA
ADRIATIC SEA
AEGEAN SEA
WHITE SEA
SEA OF AZOF
Sea of Marmora
GULF OF BOTHNIA
Gulf of Finland
G. of Riga
English Channel
Skagerrack
Cattegat
Str. of Messina
Strait of Gibraltar
Bosporus
ICELAND (TO DENMARK)
REIKJAVIK
Mt. Hekla
FAROE ISLANDS (TO DENMARK)
SHETLAND ISLANDS
ORKNEY ISLANDS
HEBRIDES
LOFOTEN ISLANDS
KOLGUEV I.
BRITISH ISLES
SCOTLAND
IRELAND
ENGLAND
NORWAY
SWEDEN
KIOLEN MTS.
LAPLAND
KOLA PEN.
FINLAND
DENMARK
NETHERLANDS
BELGIUM
GERMAN EMPIRE
FRANCE
SWITZERLAND
AUSTRIA-HUNGARY
CARPATHIAN MTS.
ITALY
APENNINES
SPAIN
PORTUGAL
CANTABRIAN MTS.
PYRENEES
BALEARIC IS.
MINORCA
MAJORCA
IVIZA
CORSICA
SARDINIA
SICILY
MALTA (Br.)
CRETE
CYPRUS
ROUMANIA
SERVIA
MONTENEGRO
BULGARIA
BALKAN MTS.
ALBANIA
GREECE
TURKEY
TURKEY IN ASIA
RUSSIA
POLAND
CRIMEA
CAUCASUS MTS.
TRANS-CAUCASIA
URAL MTS.
Tundras
ASIA
AFRICA
London
Liverpool
Manchester
Birmingham
Sheffield
Leeds
Hull
York
New Castle
Edinburgh
Glasgow
Dundee
Aberdeen
Belfast
Dublin
Londonderry
Limerick
Cork
Queenstown
Waterford
Bristol
Plymouth
Portsmouth
Southampton
Paris
Havre
Cherbourg
Brest
Nantes
La Rochelle
Rochefort
Bordeaux
Toulouse
Limoges
Orleans
Tours
Lyon
Marseille
Dijon
Lille
Geneva
BERNE
Basel
Zurich
Strassburg
Amsterdam
Rotterdam
The Hague
Antwerp
Brussels
Cologne
Frankfurt
Stuttgart
Munich
Nuremberg
Leipzig
Dresden
Breslau
Berlin
Hamburg
Bremen
Hanover
Stettin
Danzig
Konigsberg
Copenhagen
Christiania
Christiansand
Christiansund
Stavanger
Bergen
Trondhjem
Tromso
North Cape
Hammerfest
Stockholm
Upsala
Gothenburg
Helsingborg
Sundsvall
Soderhamn
Lulea
Tornea
Uleaborg
Helsingfors
Petrograd
Reval
Riga
Kovno
Vilna
Minsk
Pinsk
Warsaw
Lodz
Lublin
Vitebsk
Tver
Moscow
Nizhni Novgorod
Kazan
Samara
Saratof
Tsaritsyn
Astrakhan
Orenburg
Tula
Kursk
Kharkof
Kief
Ekaterinoslav
Kishinef
Odessa
Galatz
Rostof
Ekaterinodar
Sevastopol
Archangel
Tiflis
Baku
Mt. Elburz
Mt. Ararat
Tabriz
Trebizond
Kaisarieh
Mosul
Aleppo
Smyrna
Constantinople
Adrianople
SOFIA
BELGRADE
Bucharest
Braila
Kronstadt
Debreczin
Lemberg
Prague
Brunn
Vienna
Budapest
Trieste
Venice
Milan
Turin
Genoa
Bologna
Florence
Leghorn
Rome
Naples
Mt. Vesuvius
Taranto
Brindisi
Palermo
Messina
Mt. Etna
Catania
Cagliari
CETINJE
Salonica
ATHENS
Corinth
Madrid
Barcelona
Valencia
Cartagena
Valladolid
Bilbao
Vigo
Oporto
Lisbon
Cordoba
Seville
Cadiz
Malaga
Gibraltar (Br.)
Tangier
Fez
Oran
Algiers
Tunis
Cape Finisterre
C. St. Vincent
Samarovsk
Tobolsk
Cheliabinsk
Lake Ladoga
Lake Onega
Lake Peipus
L. Wetter
L. Wener
DAGOE
OSEL
GOTLAND
OLAND
Ob R.
Petchora R.
Dwina R.
Volga R.
Kama R.
Ural R.
Don R.
Dnieper R.
Dniester
Pruth R.
Duna R.
Vistula
Oder R.
Elbe
Rhine
Danube
Drave
Save R.
Theiss
Po R.
Rhone
Loire
Seine
Garonne
Douro R.
Tagus
Guadiana R.
30° 20° 10° 0° 10° 20° 30° 40° 50° 70° 80°
40° 50° 60° 70°
Longitude West
Longitude East from Greenwich
WILLIAMS ENGRAVING CO., N.Y.

FIG. 271.

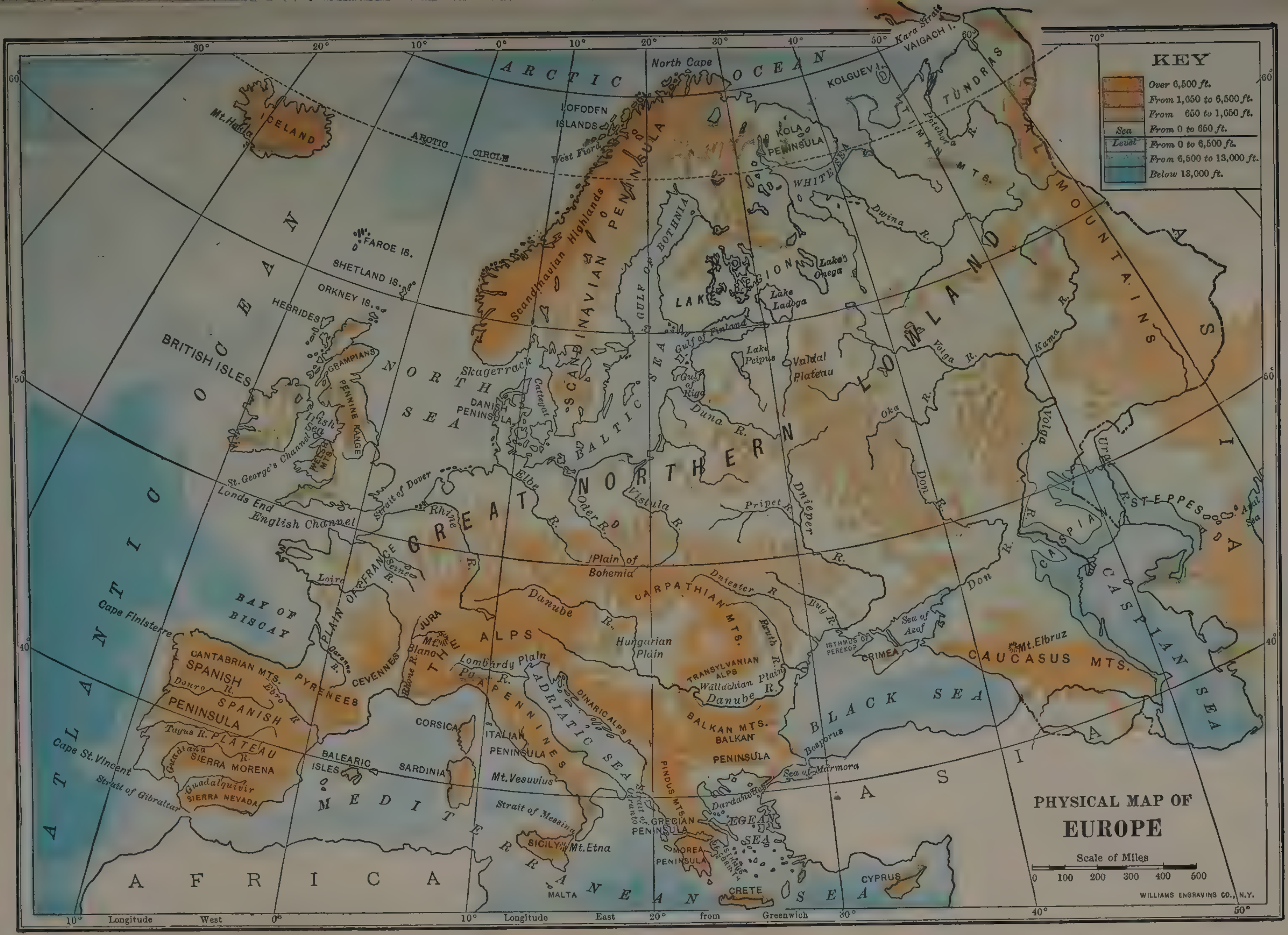

KEY
Over 6,500 ft.
From 1,650 to 6,500 ft.
From 650 to 1,650 ft.
Sea
From 0 to 650 ft.
Level
From 0 to 6,500 ft.
From 6,500 to 13,000 ft.
Below 13,000 ft.
PHYSICAL MAP OF
EUROPE
Scale of Miles
0 100 200 300 400 500
WILLIAMS ENGRAVING CO., N.Y.
ARCTIC OCEAN
North Cape
KOLGUEV I.
VAIGACH I.
Kara Strait
TUNDRAS
TIMAN MTS.
Petchora R.
URAL MOUNTAINS
ASIA
ICELAND
Mt. Hekla
ARCTIC CIRCLE
LOFODEN ISLANDS
West Fiord
KOLA PENINSULA
WHITE SEA
Dwina R.
FAROE IS.
SHETLAND IS.
ORKNEY IS.
HEBRIDES
BRITISH ISLES
GRAMPIANS
PENNINE RANGE
Irish Sea
WELSH MTS.
St. George's Channel
Lands End
English Channel
Strait of Dover
NORTH SEA
Skagerrack
Cattegat
DANISH PENINSULA
Scandinavian Highlands
SCANDINAVIAN PENINSULA
GULF OF BOTHNIA
BALTIC SEA
Gulf of Finland
Gulf of Riga
LAKE REGION
Lake Ladoga
Lakes Onega
Lake Peipus
Valdai Plateau
Duna R.
GREAT NORTHERN LOWLAND
Volga R.
Kama R.
Oka R.
Volga
Ural R.
Don R.
Dnieper R.
Pripet R.
Vistula R.
Oder R.
Elbe R.
Rhine R.
Plain of Bohemia
Dniester R.
Bug R.
Pruth R.
STEPPES
Aral Sea
CASPIAN SEA
CAUCASUS MTS.
Mt. Elbruz
Sea of Azof
CRIMEA
ISTHMUS OF PEREKOP
BLACK SEA
Bosporus
Sea of Marmora
Dardanelles
ATLANTIC OCEAN
BAY OF BISCAY
Cape Finisterre
PLAIN OF FRANCE
Seine R.
Loire R.
Garonne R.
CEVENNES
JURA
Mt. Blanc
Rhone R.
ALPS
Danube R.
Hungarian Plain
CARPATHIAN MTS.
TRANSYLVANIAN ALPS
Wallachian Plain
Danube R.
BALKAN MTS.
BALKAN PENINSULA
Lombardy Plain
Po R.
APENNINES
ITALIAN PENINSULA
Mt. Vesuvius
DINARIC ALPS
ADRIATIC SEA
Strait of Otranto
PINDUS MTS.
GRECIAN PENINSULA
MOREA PENINSULA
ISTHMUS OF CORINTH
AEGEAN SEA
CRETE
CYPRUS
CANTABRIAN MTS.
PYRENEES
Ebro R.
Douro R.
SPANISH PLATEAU
SPANISH PENINSULA
Tagus R.
Guadiana R.
SIERRA MORENA
Guadalquivir
SIERRA NEVADA
Cape St. Vincent
Strait of Gibraltar
BALEARIC ISLES
CORSICA
SARDINIA
Strait of Messina
SICILY
Mt. Etna
MALTA
MEDITERRANEAN SEA
AFRICA
30° 20° 10° 0° 10° 20° 30° 40° 50° 60° 70°
60 50 40
10° Longitude West 0° 10° Longitude East 20° from Greenwich 30° 40° 50°

FIG. 272.

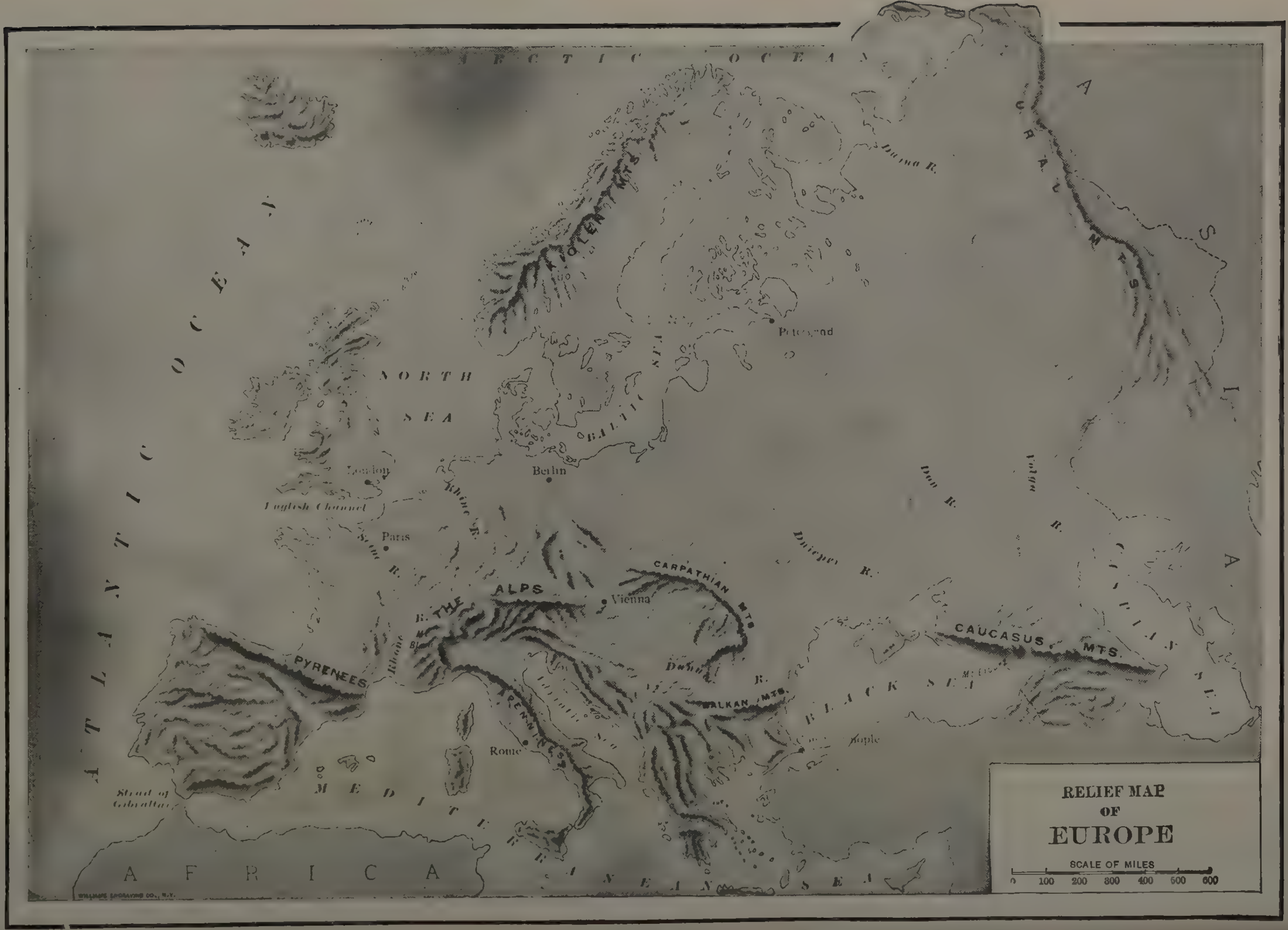

RELIEF MAP OF EUROPE
SCALE OF MILES
0 100 200 300 400 500 600
ARCTIC OCEAN
ATLANTIC OCEAN
NORTH SEA
BALTIC SEA
MEDITERRANEAN SEA
BLACK SEA
CASPIAN SEA
ASIA
AFRICA
URAL MTS.
KJOLEN MTS.
ALPS
THE ALPS
PYRENEES
APENNINES
CARPATHIAN MTS.
BALKAN MTS.
CAUCASUS MTS.
Dwina R.
Don R.
Volga R.
Dnieper R.
Danube R.
Rhine R.
Seine R.
Rhone R.
English Channel
Strait of Gibraltar
Adriatic Sea
London
Paris
Berlin
Vienna
Rome
Petrograd
C'nople

Fig. 273.

gathered on the highlands of northwestern Europe and spread outward in all directions. Figure 270 shows the extent of the European ice sheet. It made the same changes in Europe as in our country. State what these changes were.

6. Character of the coast line, and advantages it gives

The irregular coast of northwestern Europe, like that of northeastern North America, is due to the sinking of the land. The Baltic Sea and its gulfs are old land valleys, sunk beneath the sea; and the hills of this sunken land form either islands, peninsulas, or shallow banks where food fish abound.

During the growth of the mountains of southern Europe, the rising and sinking of small areas of land has made many peninsulas, with bays, gulfs, islands, and seas between. The Mediterranean Sea occupies a basin, thousands of feet in depth, formed by the sinking of this part of the earth's crust. Some of the islands in the Mediterranean Sea were partly or wholly built up by volcanic action.

As a result of all these movements of the land, Europe has the most irregular coast of all the continents. Name the larger peninsulas, gulfs, and seas that border Europe. How about the number of fine harbors? Show, by examples, how such an irregular coast is of advantage in allowing vessels to sail far into the interior of the continent.

Climate

1. The latitude of Europe

Trace the 50th parallel of latitude on a globe or map of the world. Notice that while the 49th parallel forms the northern boundary of western United States, it passes entirely south of England, crosses France near Paris, and extends through southern Germany and Russia. From this it is seen that by far the larger part of Europe lies farther north than the United States, and due east of Canada. Petrograd is in the same latitude as northern Labrador; and the tips of the peninsulas of southern Europe reach no farther south than the southern boundary of Virginia.

2. The population and crops there

In spite of this latitude, and of the fact that Europe is much less than half the size of North America, that continent supports over three times as many inhabitants as our own, or over four hundred million persons.

It is true that, in the Far North, near the Arctic Ocean, the climate is bleak, and there are barren, frozen tundras. But south of this is a belt of fir, spruce, pine, and other trees. Within the forest belt, and south of it, the climate permits the growth of the grains and fruits that flourish in southern Canada and northern United States. Farther south, in southern Europe, in the latitude of central United States, such semitropical fruits as oranges, lemons, olives, and figs are cultivated. That is to say, the products of the greater part of Europe are such as grow several hundred miles farther south in eastern North America.

3. Explanation of these surprising facts

(1) The prevailing west winds

The prevailing westerlies are felt in northern Europe as well as in the United States (p. 198). Blowing from across the warm ocean waters (p. 209), they bring an enormous amount of heat to the land. It is these west winds, more than any other thing, that make it possible for crops to be raised nearer the pole in Europe than in any other part of the globe. Without such winds, much of that densely populated continent (Fig. 274) would be a barren waste, like Labrador.

(2) The absence of north and south mountain ranges in the west

In North America, where high mountains extend north and south along the entire western side of the continent, the warm, damp air soon loses its moisture as it moves eastward (p. 197). In Europe, on the other hand, where the higher ranges extend nearly east and west, the mountains interfere much less with the movement of vapor to the interior. For that reason the west winds give up their moisture little by little, and over a wide area. This is the chief reason why there is no arid land in the belt of westerlies, from western Ireland to eastern Russia. Another reason is that, in this cool northern climate, the soil loses little of its water by evaporation.

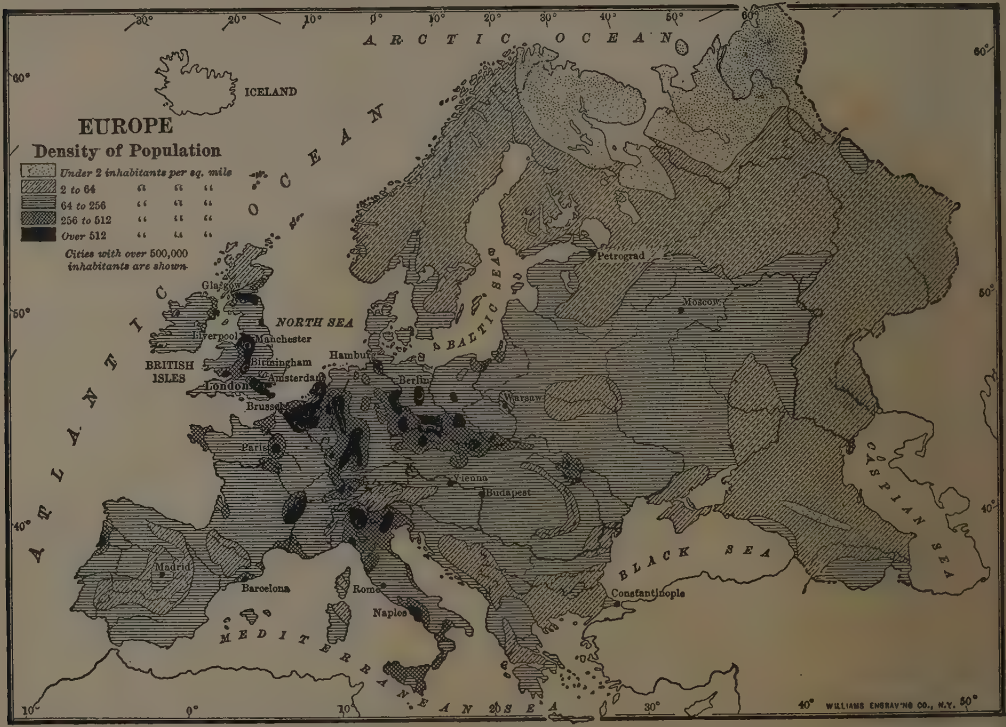


FIG. 274. — What reasons can you suggest for the fact that certain parts, like central Spain, northern Russia, and Scandinavia, and the country between the Black and Caspian seas, are not densely populated?

The effect of the ocean winds is naturally greatest near the coast, as in western North America. Therefore, England has a mild, rainy climate; but the farther east one goes, the less the influence of the ocean is felt. Thus, in eastern Russia there are great extremes of heat and cold, and there is danger of serious droughts. Compare the rainfall (Fig. 275) of these two sections.

Why southern Europe has a dry, mild climate

Southern Europe, like Southern California, is not reached by the westerlies in summer, for it then lies within the belt of the horse latitudes. This accounts for the fact that southern Spain, Italy, and Greece receive very little rain in summer. Examine Figure 275 to see where the rainfall in Europe is light.

The east-west direction of the lofty mountains exerts a great influence on the climate of the countries that lie to the north and south of them. Rising like great walls, these mountains prevent south winds from bearing northward the heat of the Mediterranean basin; and they also interfere with the passage of cold north winds. Northern Florida, much farther south than southern Europe, is sometimes visited by cold waves and frosts; but such winds cannot reach portions of southern Europe that are protected by the mountains.

The people of Europe have never been bound closely together as one great nation.

Reasons for the many countries

One of the reasons for this is the fact that so many parts of the continent are separated from all others. Spain, for example, is not only a peninsula, but it is separated from France by lofty mountains. The British Isles are entirely cut off by water; Scandinavia nearly so; and Italy is bounded on the north by the Alps, and on all other sides by water.

It is natural that people living in such positions should not feel a common interest with those who are so separated from them. Thus many different customs, beliefs, and languages have arisen; and because of these differences there are many more nations in Europe than in North America. Count them (Fig. 271).

Many jealousies and disputes have arisen between the different nations. These have often led to war, as a result of which one nation has sometimes seized territory from another. In this way the boundaries between the nations have suffered many changes. Notice how irregular some of the boundary lines are. Those of Germany, for example, have been agreed upon only after the loss of tens of thousands of human lives in war.

Review Questions

1. Why is Europe classed as a continent? 2. In the growth of the continent, tell about the formation of mountains in the northwest. 3. Where else are mountains found? What do you know about them? 4. Describe the large plain. 5. Where are the coal beds? What kinds are found? 6. Explain the irregular coast line, and state some of its advantages. 7. What is the latitude of Europe? 8. What about the population, and the farm products? 9. How is the climate influenced by the prevailing westerlies? 10. By the absence of north and south mountain ranges in the west? 11. Why is the climate of southern Europe dry and mild? 12. Give some reasons for so many countries in Europe. Why are the boundary lines often irregular?

Comparisons with North America

1. Compare Europe with North America in regard to highlands. 2. Lowlands. 3. Rivers. 4. Distribution of coal beds. 5. Extent of ice covering. 6. Character of coast line. 7. Latitude. 8. Population. 9. In what respects are the two continents alike in climate? 10. In what respects unlike in climate? 11. Compare the number of degrees of longitude in Europe with the number in North America. 12. Where are the most densely settled parts in each continent? Why this difference?

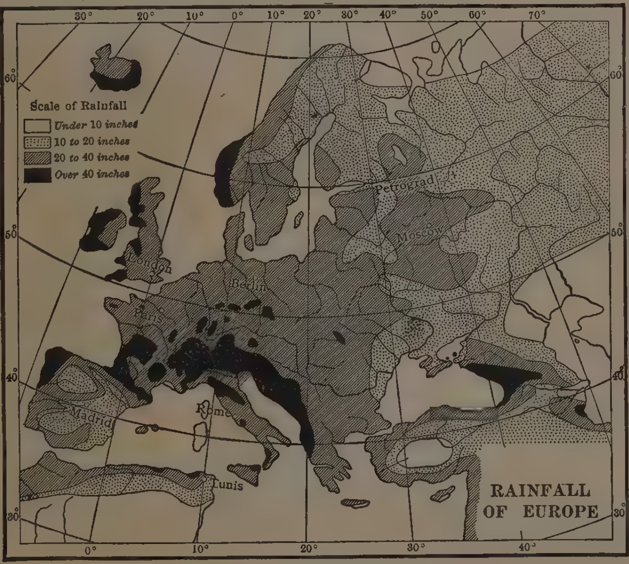


Fig. 275. — Rainfall map of Europe.

Suggestions

1. What results might follow if the mountains of Europe extended north and south near the western coast? 2. Mention some of the results if the land should rise near Gibraltar, changing the Mediterranean to a closed sea. How would the British Isles be influenced? Italy? 3. Can you tell about any of the great wars and generals of Germany, England, or France? 4. Can you tell of any of the changes in boundary lines; for example, in Poland or between France and Germany?

II. The British Isles

Map study

1. Walk toward the British Isles. 2. What two large islands do they include. 3. What waters separate these two? 2. Name the three divisions of Great Britain. 5. Locate the Orkney, Hebrides, Shetland, and Channel Islands. They are included among the British Isles. 6. What sea lies east of Great Britain? 7. What country is nearest to Great Britain (Fig. 271)? What waters separate the two? 8. Compare the coast line with that of Spain (Fig. 296); of Norway (Fig. 271).

Remarkable facts about these isles

London is fully seven hundred miles farther north than New York City, and the British Isles are in the same latitude as Labrador. England itself is a little smaller than Alabama; and the British Isles, including England, Wales, Scotland, Ireland, and several hundred small islands, are about the size of the state of New Mexico.

Yet in spite of their northern position and their small area, the largest city in the world is located in the British Isles. Moreover, Great Britain has more manufacturing than any nation excepting the United States. It has more foreign trade, a greater number of vessels upon the sea, and more colonies (Fig. 287) than any other nation on the earth.

The character of the British people doubtless offers one important explanation of the above facts. Being so near the mainland, the islands have been invaded by many hardy people, among them the *Angles* and *Saxons*, from whom the words *English* and *Anglo-Saxons* have been derived. The *Normans* also entered Britain, and still earlier the Romans under the lead of Julius Cæsar.

Their importance partly explained

1. By the character of their inhabitants

Although formerly divided into different nations, England, Scotland, Wales, and Ireland are now united to form the *United Kingdom of Great Britain and Ireland.*

The inhabitants of each of these sections are noted for their energy, intelligence, and good character.

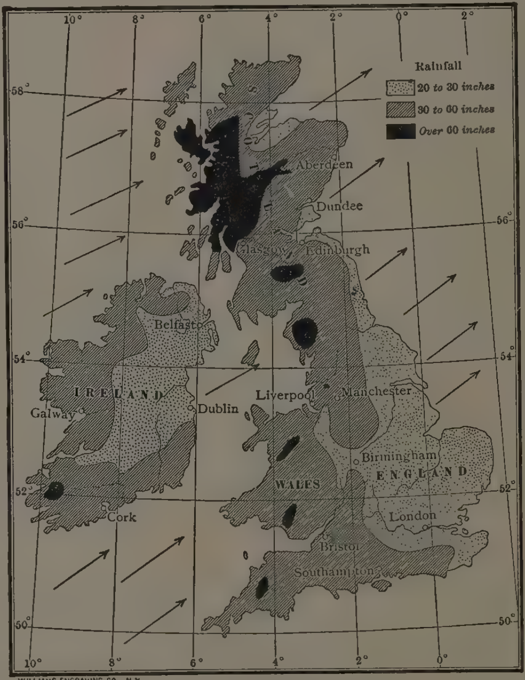


Fig. 276.—Rainfall of British Isles.

2. By the prevailing winds

The prevailing westerly winds also partly account for the greatness of the United Kingdom. Two days out of three these winds blow across the British Isles; and, since they have crossed a vast expanse of warm water (p. 243) they greatly temper the climate. Indeed, the winter season is milder than that in northern United States, and the summer is cooler.

The prevailing westerlies, bearing an abundance of moisture (p. 243), so distribute it over the islands that no section suffers from drought. Yet the western portions receive more rain than the eastern, because the damp ocean winds reach them first (Fig. 276).

As already stated (p. 238), the mountains of Great Britain, like those of New England, are so old that they are worn very low.

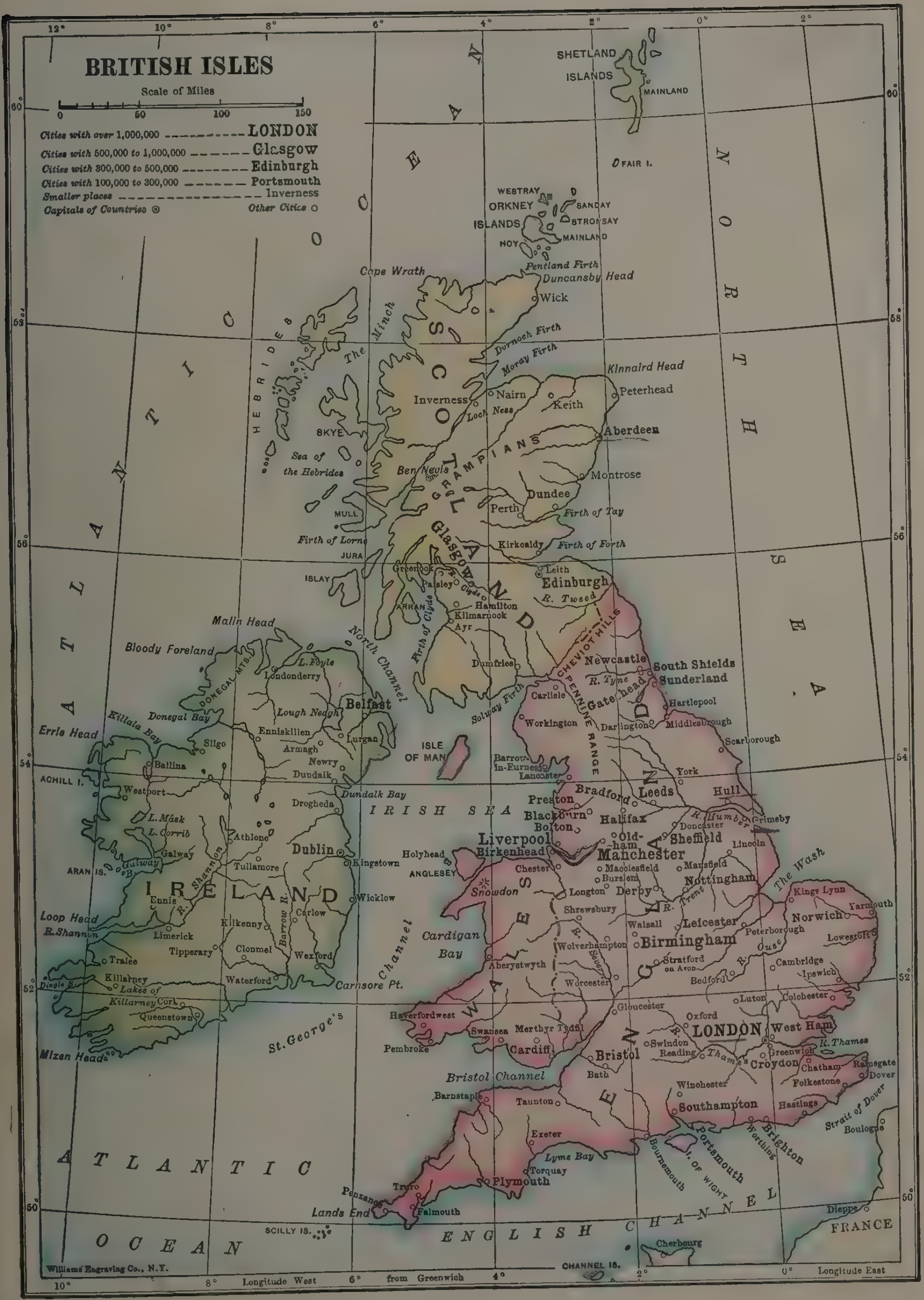

BRITISH ISLES
Scale of Miles
0
50
100
150
Cities with over 1,000,000 LONDON
Cities with 500,000 to 1,000,000 Glasgow
Cities with 300,000 to 500,000 Edinburgh
Cities with 100,000 to 300,000 Portsmouth
Smaller places Inverness
Capitals of Countries ⊙
Other Cities ○
12°
10°
8°
6°
4°
2°
0°
2°
60°
58°
56°
54°
52°
50°
ATLANTIC OCEAN
NORTH SEA
SHETLAND ISLANDS
MAINLAND
FAIR I.
ORKNEY ISLANDS
WESTRAY
SANDAY
STRONSAY
MAINLAND
HOY
Pentland Firth
Duncansby Head
Cape Wrath
Wick
HEBRIDES
The Minch
Dornoch Firth
Moray Firth
Kinnaird Head
Peterhead
Inverness
Nairn
Loch Ness
Keith
Aberdeen
SKYE
Sea of the Hebrides
GRAMPIANS
Ben Nevis
Montrose
Dundee
Perth
Firth of Tay
MULL
Firth of Lorne
JURA
ISLAY
SCOTLAND
Glasgow
Kirkcaldy
Firth of Forth
Leith
Edinburgh
R. Tweed
Greenock
R. Clyde
Paisley
ARRAN
Firth of Clyde
Hamilton
Kilmarnock
Ayr
Dumfries
North Channel
Malin Head
Bloody Foreland
DONEGAL MTS.
L. Foyle
Londonderry
Lough Neagh
Belfast
Donegal Bay
Killala Bay
Erris Head
Sligo
Enniskillen
Armagh
Lurgan
Newry
Dundalk
Ballina
ACHILL I.
Westport
L. Mask
L. Corrib
Galway
Galway B.
ARAN IS.
Athlone
Tullamore
Drogheda
Dundalk Bay
Dublin
Kingstown
IRISH SEA
IRELAND
R. Shannon
Ennis
Loop Head
R. Shannon
Limerick
Tipperary
Kilkenny
Barrow R.
Carlow
Wicklow
Clonmel
Wexford
Tralee
Dingle B.
Killarney
Lakes of Killarney
Cork
Queenstown
Waterford
Carnsore Pt.
Mizen Head
St. George's Channel
CHEVIOT HILLS
PENNINE RANGE
Solway Firth
Carlisle
Newcastle
R. Tyne
Gateshead
South Shields
Sunderland
Hartlepool
Workington
Darlington
Middlesbrough
Scarborough
ISLE OF MAN
Barrow-in-Furness
Lancaster
York
Preston
Bradford
Leeds
Hull
Blackburn
Halifax
R. Humber
Grimsby
Bolton
Oldham
Doncaster
Liverpool
Birkenhead
Manchester
Sheffield
Lincoln
Holyhead
ANGLESEY
Chester
Macclesfield
Burslem
Mansfield
Nottingham
The Wash
Snowdon
Longton
Derby
R. Trent
Kings Lynn
Yarmouth
Shrewsbury
Walsall
Leicester
Norwich
Lowestoft
WALES
R. Severn
Cardigan Bay
Wolverhampton
Birmingham
Peterborough
R. Ouse
Aberystwyth
Stratford on Avon
Cambridge
Ipswich
Worcester
Bedford
Luton
Colchester
Haverfordwest
Gloucester
Oxford
Swansea
Merthyr Tydfil
Swindon
LONDON
West Ham
R. Thames
Pembroke
Cardiff
Bristol
Reading
Greenwich
Croydon
Chatham
Ramsgate
Dover
Bristol Channel
Bath
Winchester
Folkestone
ENGLAND
Barnstaple
Taunton
Southampton
Hastings
Strait of Dover
Boulogne
Exeter
Portsmouth
Worthing
Brighton
Lyme Bay
Bournemouth
I. OF WIGHT
Torquay
Plymouth
Penzance
Truro
Lands End
Falmouth
SCILLY IS.
ENGLISH CHANNEL
Dieppe
FRANCE
Cherbourg
CHANNEL IS.
Williams Engraving Co., N.Y.
Longitude West from Greenwich
Longitude East

FIG. 277.

3. By the character of the surface

While these uplands rarely rise more than one or two thousand feet above sea level, there are occasional higher peaks of hard rock. For example, the granite peak of Ben Nevis, in Scotland, the highest point in the British Isles, is forty-three hundred feet in elevation. The *Scottish Highlands* (Fig. 278) are so rugged and barren that few people are able to live there.

Where the rocks are softer, and less disturbed by mountain folding, there are lower and more level tracts. Point out the broadest lowland of Ireland, Scotland, and England (Fig. 273). A narrow and very small, but important, lowland lies in southern Scotland, near Edinburgh and Glasgow. There the rocks are so much softer than those of the highlands that, instead of a barren, hilly country, there is a fertile lowland. Upon this, called the *Lowlands of Scotland*, there are thriving industries and a dense population, as in many parts of England.

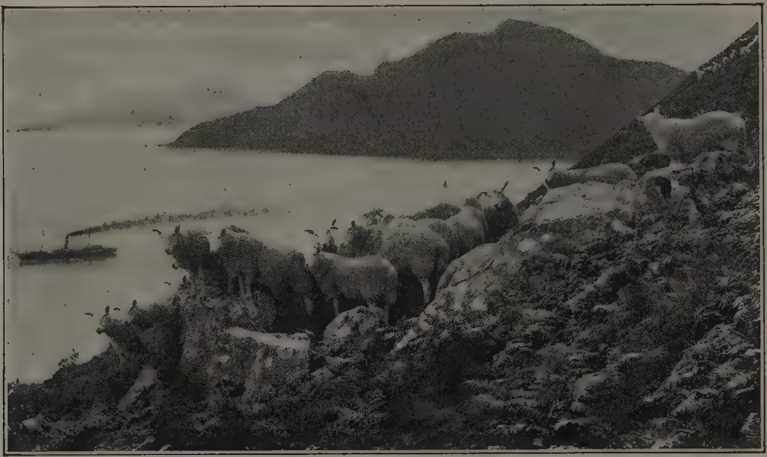


Fig. 278. — Sheep grazing on the mountain slopes in the Scottish Highlands.

A highland rim extends around Ireland (Fig. 273), inclosing a lower, more level interior. Thus the surface of this island has the form of a shallow plate, and much of the land can be cultivated.

A large part of these islands, therefore, is either plain or low, hilly land, suited to agriculture. Thus the surface features have helped to make the British Isles an important nation.

4. By the irregular coast line

The coast line of the British Isles is very irregular, as may be seen from the map (Fig. 277). State the reasons (p. 243). How does the coast compare with that of New England? Since the mountainous western portion had more deep valleys for the sea to enter than the level plains of the east, there are more good harbors on the west than on the east coast. On both sides, however, the mouths of the larger rivers usually make good ports. Why?

5. By the natural resources

Another reason for the importance of the United Kingdom is the fact that these islands have great natural resources, and have therefore developed important industries. In our study of the United States we found that the people are mainly engaged in lumbering, agriculture, fishing, mining, manufacturing, and commerce. There is very little lumbering in the British Isles, for, although in early times a large part of the land was wooded, little forest now remains; and lumber is, therefore, one of the leading imports. But all of the other industries are important, and some of them are remarkably developed.

Agriculture

1. Live stock

Since no portion of the British Isles is arid, the ranching industry is not developed there as in western United States. Much live stock is raised, however (Fig. 278). In fact, grazing has of late so increased in importance that there is now twice as much land in pasture as in crops, and the British Isles are noted for their great number of fine cattle, sheep, and horses. There are about thirty million sheep on the Isles, and there are forty-five million people. The Shetland Islands are famous for Shetland ponies; and on the three Channel Islands, — Jersey, Guernsey, and Alderney, near the French coast, — three breeds of cattle have been developed, which are well known in the United States.

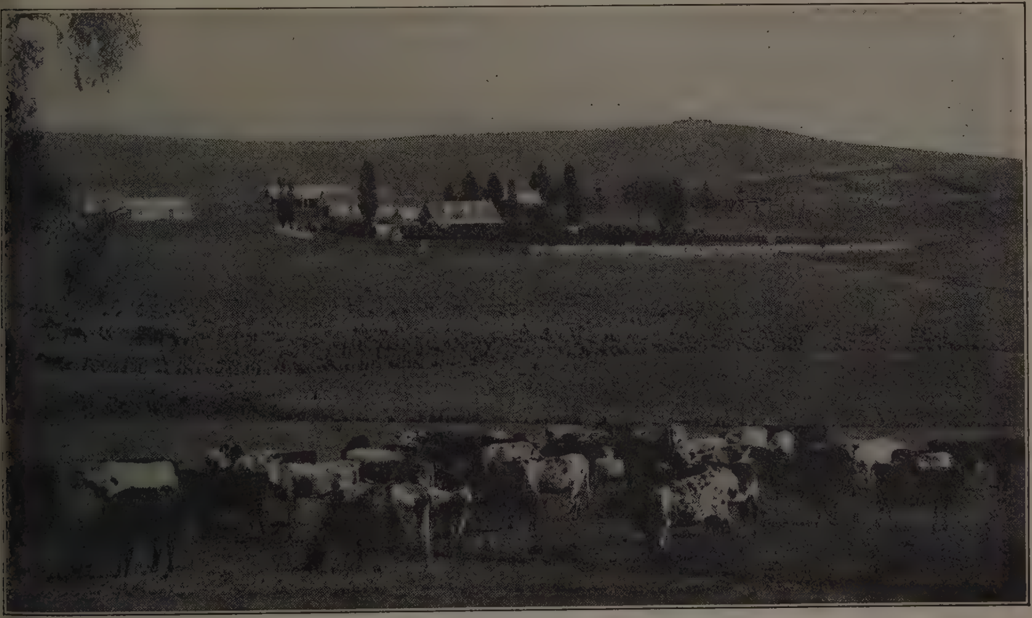


Fig. 279. — An English farm with a flock of sheep and a herd of cattle grazing in the pasture.

The importance of grazing is partly explained by the fact that much of the surface, like that of New England, is too rocky or mountainous to be cultivated (Fig. 278). Besides this, some of the plains in eastern England, although too sterile for farming, make excellent pasture land (Fig. 279). The mild winters and the damp air, which encourage the growth of grass, further favor stock raising. In addition, the cheapness with which grain is raised in other countries, like the United States, and carried to the British Isles, has made it less necessary for the British to use their land in raising grain.

2. Other farm products

The cool summer climate, which is of advantage in some respects, is unfavorable to many kinds of farming. For example, it prevents the production of corn, cotton, tobacco, and grapes, which require warm summers. More hardy products, however, such as oats, barley, and wheat, are easily raised. Turnips, potatoes, beans, and peas are other important crops.

The demand for farm land has been so great that large areas of swamp have been reclaimed by careful drainage, and these now make some of the most fertile farms. Yet in spite of the care that has been given to cultivating the soil, and to raising live stock, far less food is produced in the British Isles than is needed by the inhabitants. There are such vast multitudes of people engaged in other occupations that, if they were deprived of food from abroad, they would, it is said, begin to suffer from famine within a month. How different that is from our own country, which has so large an area, and so varied a climate, that it not only supplies the food we need, but produces enormous quantities to be sent abroad!

Fishing

Since the early inhabitants had to cross the sea in order to reach these islands, and since most of their descendants have lived either on or near the coast, it is natural that many of the British should adopt a seafaring life. This sort of life has also been encouraged by the fact that food fish abound on the shallow banks of the North Sea and of the ocean to the north and west of the islands. More than one hundred thousand men and twenty-five thousand boats from the British Isles are employed in fishing.

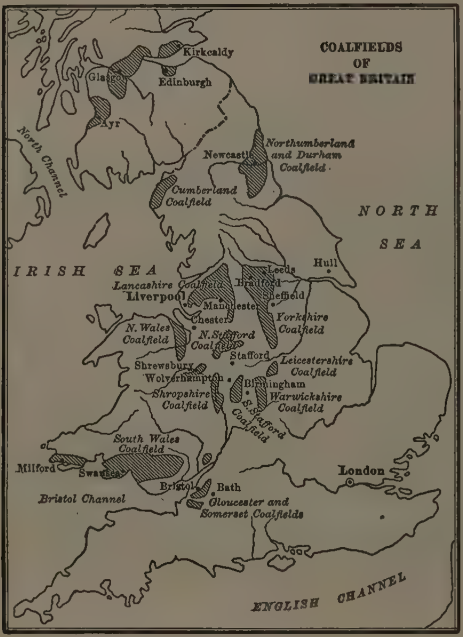


Fig. 280. — Map showing coal distribution in British Isles.

Among the fish caught are cod, haddock, and herring, as off the coast of New England and Newfoundland. Another important kind is a flatfish, the sole, which resembles the flounder of our eastern coast. Salmon enter the rivers of northern Great Britain, and oysters are found along the southern coast. Many fishing hamlets are scattered along the coast; but the fishing industry here, as in our country, is becoming centered more and more in the large towns, which possess the capital for large vessels and expensive fishing outfits. The chief fishing centers, like Boston and Gloucester in Massachusetts, are London, Hull, and Grimsby (Fig. 277) in England, and Aberdeen in Scotland.

Mining

1. The less common minerals

One of the resources of the British Isles which early attracted people from southern Europe was the tin in southwestern England. This metal is not mined in many parts of the world, but has always been in great demand. Even before the time of Cæsar, ships from the Mediterranean came to England to obtain tin for use in the manufacture of bronze. Small quantities of copper, lead, zinc, and even gold and silver ores, have also been discovered in the British Isles; but at present there is little mining of these metals.

2. Coal and iron ore

On the other hand, the abundance of two other minerals, coal and iron ore, reminds us of our own country. The one small island of Great Britain produces more than half as much coal as all of our states together; and the United States and Great Britain are the two leading coal-producing countries of the world. Figure 280 shows the sections of Great Britain in which coal is found. While most of the coal is bituminous, that in southern Wales is more like our anthracite. Large numbers of miners in the United States are Welshmen who have come from that section.

Iron ore is also abundant and favorably situated. None of the British iron ore is far from coal; and in some places the same shaft is used to bring both coal and iron to the surface. Limestone is also abundant and near at hand. This reminds us of the conditions at Birmingham, Ala. (p. 72), which is named after BIRMINGHAM, England, because each resembles the other in having an abundance of coal and iron ore near together. Find Birmingham in Figure 280. Note the other cities near the coal fields. Why should large manufacturing cities develop here? The extent of the mining industry in the United Kingdom is indicated by the fact that more than half a million persons are employed underground.

3. Other important mineral products

Besides these minerals, various building stones are extensively quarried, as granite in Scotland, and slate in northern Wales. Salt is also found; and there is clay of such excellent quality for earthenware that several towns have become noted for their potteries, as have Trenton and Cincinnati in the United States.

Manufacturing

1. Conditions favorable to its development

Considering the abundance of coal and iron ore on the one hand, and of wool from the millions of sheep on the other, it is clear that Great Britain has materials for extensive manufacture. As in New England, the hilly sections have abundant water power due to the glacier, and this also has favored manufacturing. Later, when the use of steam became known, the abundant stores of coal were of great importance.

2. Leading kinds

(1) Woolen manufacturing

In the mountainous section of northern England, near both coal and wool, there are hundreds of factories for the manufacture of woolen cloth. The principal center of this trade is LEEDS, which has the added advantage of water power. On the western side of this hilly region is BRADFORD, noted for its broadcloth and worsted goods, and neighboring cities manufacture woolen yarn, hosiery, carpets, and blankets. The woolen industry extends northward into Scotland and southward to LEICESTER, where the surrounding plains produce a breed of sheep that yields a wool suitable for the manufacture of worsted yarn.

(2) Cotton manufacturing

From the spinning and weaving of wool it was easy to turn to the manufacture of cotton goods; and on the western side of the northern mountains we find a great cotton-manufacturing industry. Dampness is one of the points in favor of that section, for in a dry air cotton is in danger of becoming too brittle to spin and weave easily. Another reason why this work is best developed on the west side of the island is the fact that it is nearer the United States, from which so much of the raw cotton comes.

Since the British climate will not permit the cultivation of cotton, it is necessary to import all that is used. It requires over two billion pounds a year to supply the mills. Although much cotton is now obtained from Egypt, India, and other parts of the British Empire, our Southern States still supply the greatest quantity. The center of the cotton manufacturing is MANCHESTER. What other cities do you find situated near by?

The central portion of Great Britain, including southern Scotland and the two sides of the mountain range of northern England, is the seat of the greatest textile industry in the world. Can you name cities of New England which are likewise engaged in cotton and woolen manufacture?

(3) Iron and steel manufacturing

The cities of Great Britain that are most noted for iron and steel products are BIRMINGHAM and SHEFFIELD in England, and GLASGOW in Scotland. BIRMINGHAM manufactures jewelry, watches, firearms, bicycles, steam engines, etc. SHEFFIELD has for centuries been noted for its cutlery, the presence

FIG. 281. — Loch Lomond, a beautiful lake on the southern border of the Scottish Highlands.

of grindstone quarries in the neighborhood being one reason for this particular industry. Why? Sheffield also manufactures steel rails and armor plates for war ships. GLASGOW is a center for shipbuilding and for the manufacture of locomotives and machinery of various kinds. In the smaller cities and towns near these places, there are similar works.

Thus we see that here, as in the United States, coal makes possible an enormous manufacturing industry. There is so much coal in Great Britain that, in spite of the forest of chimneys in England and southern Scotland, the output of coal is more than sufficient to meet the demands. The raw materials for manufacture, however, are not sufficient; for all the cotton, much of the wool, and part of the iron ore must be imported.

The three industries connected with cotton, wool, and iron have made Great Britain one of the great workshops of the world. The most important is cotton manufacturing; iron ranks next; and wool is third.

Contrast of Ireland with Great Britain

1. In prominence of its agriculture

What has thus far been said applies chiefly to Great Britain; but Ireland forms a striking contrast to Great Britain in several respects. In the first place, it is mainly a country of farms instead of manufactures (Fig. 282). The mild climate and damp air insure excellent grass throughout the year, and about four fifths of the farm land is in pasture. It follows, therefore, that great numbers of cattle, sheep, and horses are raised. As in Great Britain, the principal grain is oats; but barley, wheat, potatoes, and turnips are also grown.

2. In mining

Again, unlike Great Britain, Ireland is very barren of minerals. Building stones, such as granite, marble, and sandstone, are found, but there is very little coal or iron.

The lack of coal for domestic use is partly made up by the abundance of "turf," or peat. Owing to the deposits of glacial drift, which have formed dams across the streams (Fig. 270), the level interior is so poorly drained that swamps, or *bogs*, occupy about one twelfth of the entire surface of the island. The water in these bogs protects the swamp vegetation from decay, so that such vegetation collects until it forms a sod, which, when dug up and dried, makes a fairly good fuel.

3. In manufacturing

On account of the lack of fuel, most of the manufacturing in Ireland is done on the eastern side, where coal is easily obtained from England or Scotland. At one point the two islands are only thirteen miles apart. One of the most important manufacturing industries is the making of linen. The Irish linens, which take high rank in our country, are made from the inner bark of the flax plant. Flax is grown in various parts of the United States, but mainly for the sake of the seed, from which linseed oil is made for use in mixing paints and in making varnish. In Ireland, however, flax is raised chiefly for its fiber. The damp climate there is favorable to its growth, and the cheap labor makes possible the great amount of care required in preparing it for the manufacture of linen.

Principal cities

1. Their location, and connection with one another

The cities most noted for manufacturing have already been mentioned; namely, LEEDS, BRADFORD, MANCHESTER, SHEFFIELD, BIRMINGHAM, and GLASGOW. What industries are developed in each? Tell where each is located.

There are other large cities along the coast; for so much manufacturing calls for an enormous import of raw materials and food, as well as the export of manufactured goods. These cities must, therefore, be the gateways to and from the island. Since Great Britain lies far north, between Europe and the New World, these shipping points are naturally located on the eastern, western, and southern sides, at those points where the best harbors exist, and not far from the great industrial centers.

FIG. 282. — A country village in Ireland, surrounded by pastures and fields of grain.

First among the coastal cities to be noted is LONDON, on the east side, with BRISTOL opposite it on the west coast. North of London is HULL, with LIVERPOOL on the opposite side; and in southern Scotland is EDINBURGH, near the coast, paired with GLASGOW on the west. On the south side the two most important ports are SOUTHAMPTON and PORTSMOUTH. What are the two principal cities of Ireland? Locate each.

Steamships, railway lines, and canals connect the various cities, carrying immense quantities of freight. In Great Britain and Ireland there are nearly four thousand miles of canal and over twenty-three thousand miles of railway.

London, the capital of the empire and the largest city in the world, is situated on the Thames River. Like many other British

2. London
(1) *Its location*

rivers, the Thames has a wide, deep mouth, owing to the sinking of the land. London is located upon its banks as far inland as high tide allows vessels to go, or fifty miles from the open sea. The advantage of this position lies in the fact that, while it is in the interior of the island, it has direct water communication with foreign countries.

New York, we know, owes its greatness largely to the fact that it is the gateway to a productive interior, with an enormous area; but almost any point in England may be reached by rail from London in a few hours. Although Great Britain is so small, its population is nearly one half as great as that of the entire United States; and the port of London is the point of entrance for much of its food.

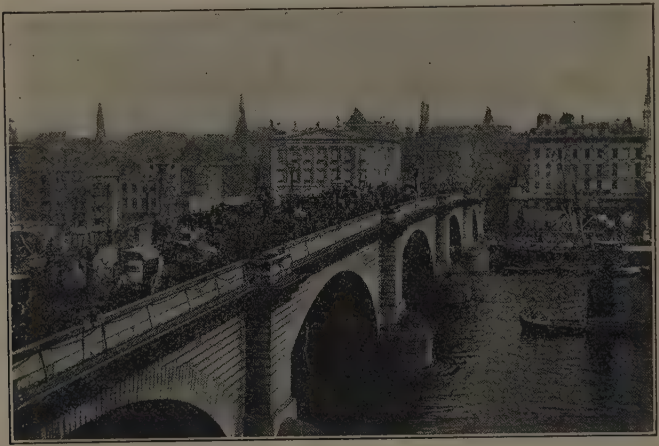


Fig. 283.—London Bridge across the Thames, over which a stream of people and wagons is almost constantly passing.

(2) *Early history and present size*

Even before the Romans came to England, the site of London was a fortified camp, situated on a low hill surrounded by tidal marshes and mud flats. The Romans had a ferry at this point; and much later, over eight hundred years ago, the first London Bridge was built (Fig. 283). This gave the city a great start. Since that time, it has grown until Greater London now includes over 7,000,000 persons. How does that compare with the number in Scotland? In Ireland? In New York City?

(3) *Manufacturing and commerce*

As in all great cities, one of the principal industries is manufacturing. Nearly all kinds of goods are made, as in New York, Chicago, and Philadelphia. However, the fact that London lacks coal and iron near at hand places it at some disadvantage in manufacturing as compared with Liverpool and Glasgow.

London is the greatest shipping point in the world. Its rows of piers extend twenty miles down the river, and its railways radiate in all directions. It is not so noted for its export of manufactured goods as are Liverpool and Glasgow, which are nearer the great manufacturing districts; but it is the chief center for imports. For example, nearly all the tea and wine used in Great Britain enter through London. The great warehouses are filled with goods from all climes, such as flour, sugar, meat, tobacco, hides, and cocoanuts.

(4) *Importance in other ways*

London is the capital of the *British Empire* (Fig. 287), which is the name given to the United Kingdom and its dependencies. It is a center for the publication of books and magazines, and is provided with noted picture galleries, libraries, museums, and magnificent buildings.

Its wealth and trade are so extensive that it has been the money center of the world, though New York, the money center of the United States, now rivals it. The leading bank, called the Bank of England, is the agent of the government in much of its business, and employs about a thousand persons.

Southwest of London, on the coast, is

Fig. 284. — The famous Westminster Abbey in London.

3. Other English cities

(1) In the south of England

Southampton, where many ocean steamers from the United States stop and where fast trains wait to convey passengers to the metropolis. Close to Southampton is Portsmouth, which has a great navy yard.

Almost due west of London, near the head of Bristol Channel, is Bristol, which is engaged in the lumber trade and in tobacco and chocolate manufacturing. It was formerly next to London in size, but Liverpool has now far outstripped it. Can you suggest some reason why? Just west of Bristol is Cardiff, in Wales, the chief British port for the export of coal.

(2) In the north

Knowing the occupation of the dense population in northern England, we can tell the principal exports of Hull and Liverpool. What must they be? The former city naturally trades mainly with Europe, and the latter with the Americas and West Africa.

Before the discovery of the New World, the west side of Great Britain had little commerce, and Liverpool, therefore, had little business or growth. With the settlement of America, however, the city grew until it now has an immense trade with North and South America, and is the third city in size in the United Kingdom. Many passengers from America land at this port and go to London by rail. Besides its commerce, Liverpool is also important for its shipbuilding. Why is this a favorable place for such an industry? A ship canal, about thirty-five miles in length, has been built to Manchester, at an expense of $75,000,000.

4. Cities of Scotland

Glasgow (Fig. 277), on the west side of the Lowlands of Scotland, is second to London in size among British cities. It is a leading manufacturing center and shipping point, for the same reasons that Liverpool is. State these reasons. What must be some of its principal imports and exports? Why?

Edinburgh, unlike the other large cities named, is not very important either as a shipping point or as a manufacturing center. It is distinguished as the capital of Scotland, and as one of the most beautiful cities in the British Isles. In former days, before Glasgow developed commerce with America, Edinburgh was much more important than Glasgow; for it commanded the entrance to the Lowlands of Scotland. It still has important trade, and is a noted educational center. The well-known University of Edinburgh is situated here. Leith, a short distance away, is the port for Edinburgh.

Farther north, on the coast, are Dundee and Aberdeen (p. 250). The former sends forth a number of Arctic whaling vessels each year, and is also engaged in the manufacture of linen.

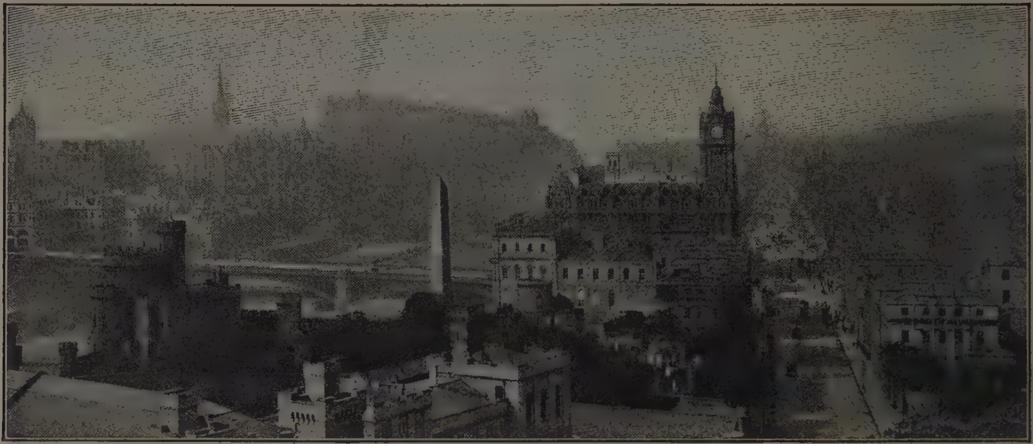


FIG. 285. — The city of Edinburgh.

5. Cities of Ireland

The principal cities of Ireland are on the east and south sides. Why? It is also noted for its shipbuilding. DUBLIN, the capital of Ireland, and the chief port for the English trade, ships farm and other products to England and receives manufactured goods in return. QUEENSTOWN has a fine harbor, and is a port of call for vessels bound from America to Great Britain.

Fuller reasons for greatness of British Empire

While we have learned many facts about the British Isles, some important questions are not yet fully answered. For example, why does this little country possess more colonies (Fig. 287) than any other nation of the earth? Further, why should it have the greatest foreign trade? And why the greatest number of vessels upon the sea?

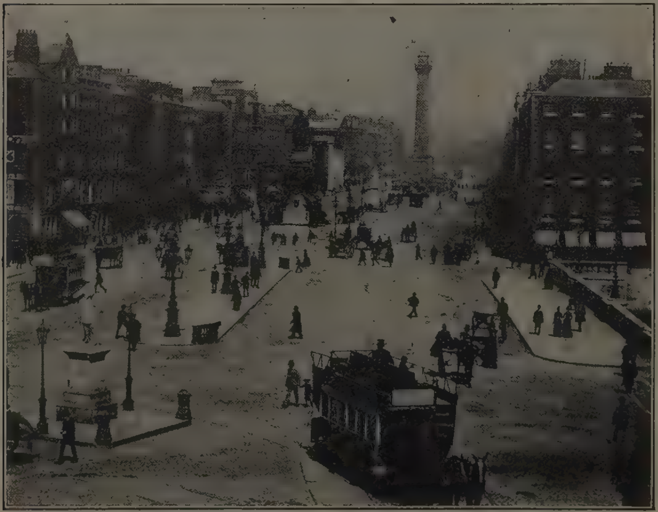


FIG. 286. — A street scene in Dublin. England

1. Why so many colonies

Some of the reasons in answer to these questions are as follows: The fact that Great Britain is so small — no point in the island being more than seventy miles from salt water — is a reason why many of the British have become sailors. It is not surprising, therefore, that they have been great explorers.

Nor is it to be wondered at that, as these explorers discovered new parts of the world, they laid claim to them in the name of their mother country. In this way, and by war, Great Britain came into possession of

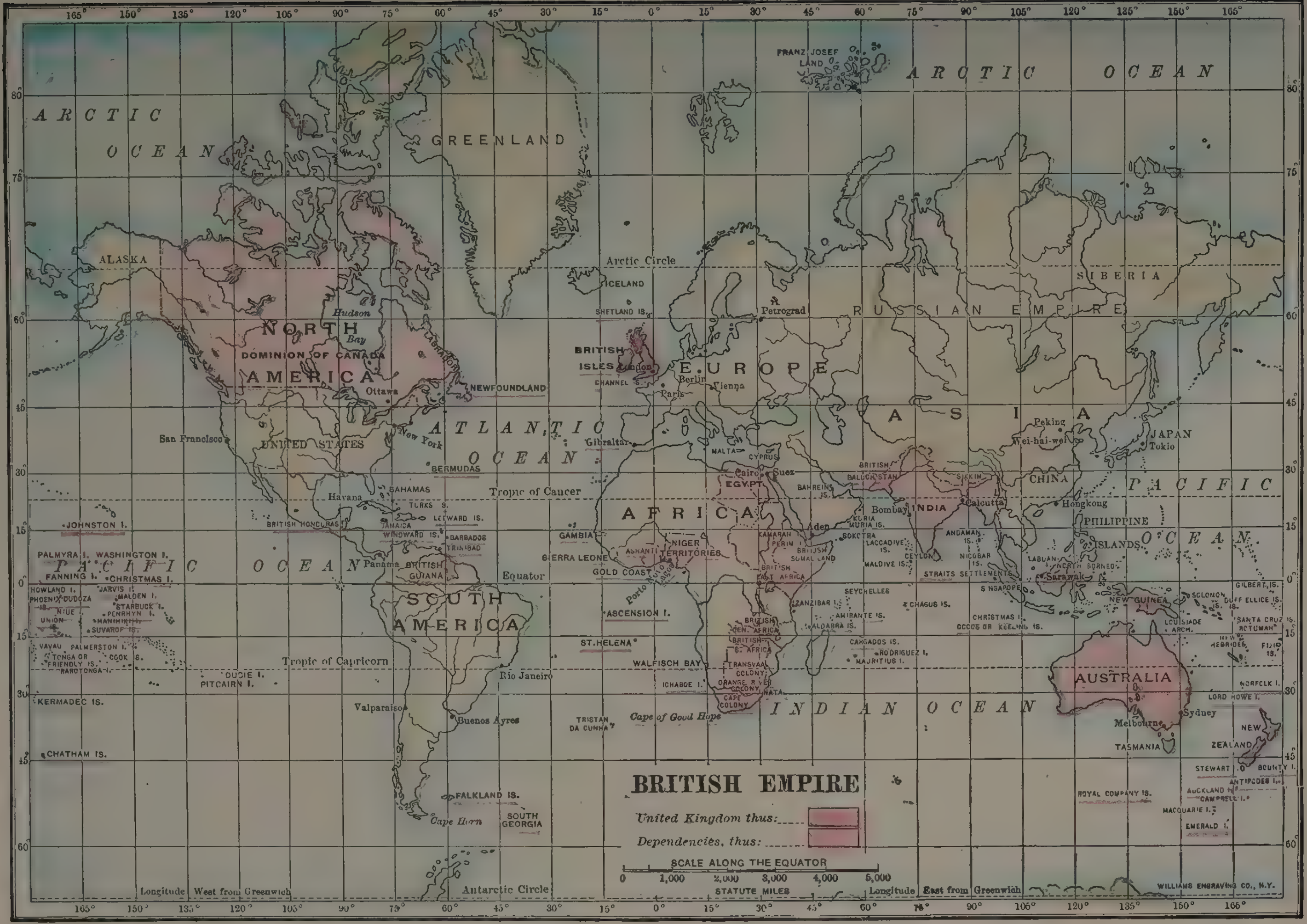

BRITISH EMPIRE
United Kingdom thus:
Dependencies, thus:
SCALE ALONG THE EQUATOR
0 1,000 2,000 3,000 4,000 5,000
STATUTE MILES
Longitude West from Greenwich
Longitude East from Greenwich
WILLIAMS ENGRAVING CO., N.Y.
ARCTIC OCEAN
GREENLAND
ALASKA
NORTH AMERICA
DOMINION OF CANADA
Hudson Bay
LABRADOR
NEWFOUNDLAND
Ottawa
UNITED STATES
San Francisco
New York
BERMUDAS
BAHAMAS
Havana
BRITISH HONDURAS
JAMAICA
TURKS I.
LEEWARD IS.
WINDWARD IS.
BARBADOS
TRINIDAD
Panama
BRITISH GUIANA
SOUTH AMERICA
Rio Janeiro
Valparaiso
Buenos Ayres
FALKLAND IS.
Cape Horn
SOUTH GEORGIA
Antarctic Circle
ATLANTIC OCEAN
Tropic of Cancer
Equator
Tropic of Capricorn
Arctic Circle
ICELAND
SHETLAND IS.
BRITISH ISLES
London
CHANNEL IS.
EUROPE
Paris
Berlin
Vienna
Petrograd
Gibraltar
MALTA
CYPRUS
AFRICA
Cairo
Suez
EGYPT
GAMBIA
SIERRA LEONE
ASHANTI
GOLD COAST
NIGER TERRITORIES
Porto Novo Lagos
ASCENSION I.
ST. HELENA
WALFISCH BAY
ICHABOE I.
TRISTAN DA CUNHA
Cape of Good Hope
CAPE COLONY
ORANGE RIVER COLONY
TRANSVAAL COLONY
NATAL
BRITISH S. AFRICA
BRITISH CEN. AFRICA
BRITISH EAST AFRICA
BRITISH SOMAL LAND
KAMARAN
PERIM
Aden
SOKOTRA
ZANZIBAR I.
SEYCHELLES
AMIRANTE IS.
ALDABRA IS.
CARGADOS IS.
RODRIGUEZ I.
MAURITIUS I.
CHAGUS IS.
BAHREINS IS.
KURIA MURIA IS.
RUSSIAN EMPIRE
SIBERIA
ASIA
BRITISH BALUCHISTAN
INDIA
Bombay
Calcutta
SIKKIM
LACCADIVE IS.
MALDIVE IS.
CEYLON
ANDAMAN IS.
NICOBAR IS.
STRAITS SETTLEMENTS
SINGAPORE
CHRISTMAS I.
COCOS OR KEELING IS.
CHINA
Peking
Wei-hai-wei
Hongkong
JAPAN
Tokio
PHILIPPINE ISLANDS
LABUAN
NORTH BORNEO
Sarawak
NEW GUINEA
LOUISIADE ARCH.
SOLOMON IS.
GILBERT IS.
ELLICE IS.
SANTA CRUZ IS.
ROTUMAH
NEW HEBRIDES
FIJI IS.
AUSTRALIA
Sydney
Melbourne
TASMANIA
NORFOLK I.
LORD HOWE I.
NEW ZEALAND
STEWART I.
BOUNTY I.
ANTIPODES I.
AUCKLAND IS.
CAMPBELL I.
MACQUARIE I.
EMERALD I.
ROYAL COMPANY IS.
INDIAN OCEAN
PACIFIC OCEAN
FRANZ JOSEF LAND
JOHNSTON I.
PALMYRA I.
WASHINGTON I.
FANNING I.
CHRISTMAS I.
HOWLAND I.
JARVIS I.
MALDEN I.
PHOENIX IS.
DUDOZA
STARBUCK I.
NIUE
PENRHYN I.
UNION IS.
MANIHIKI I.
SUVAROF IS.
VAVAU
PALMERSTON I.
TONGA OR FRIENDLY IS.
COOK IS.
RAROTONGA I.
DUCIE I.
PITCAIRN I.
KERMADEC IS.
CHATHAM IS.

FIG. 287.

the Thirteen Colonies of North America, and of Canada, India, Australia, much of Africa, and many other places (Fig. 287). At present her territory includes about one fifth of the land surface of the globe, and one quarter of its inhabitants.

2. Why so great a foreign commerce

These colonies and dependencies help to explain Great Britain's enormous foreign commerce; for the colonies have found it more to their advantage to trade with the mother country than with other nations, which speak a different language and have less understanding of them or sympathy with them. The colonies sell raw products and food stuffs to the mother country, and she sends to them clothing, steel goods, and other manufactured articles. It is largely the exchange of goods with these colonies that has made the foreign trade of Great Britain nearly twice that of any other nation. Next to her colonies, Great Britain's greatest trade is with the United States.

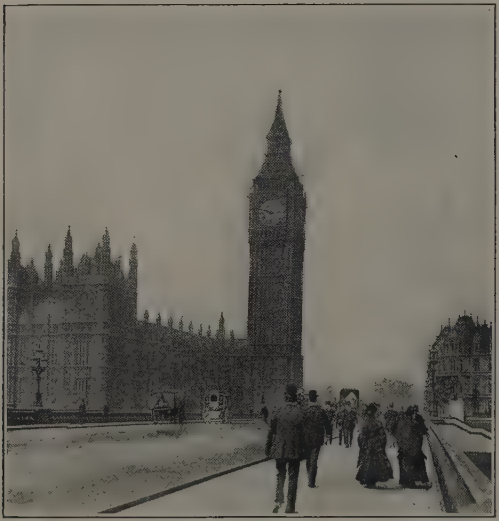


Fig. 288. — The House of Parliament in London, where the House of Lords and House of Commons meet.

3. Why so many ships

Some of the reasons why this little island owns more vessels than any other nation have already appeared. In fishing, exploring, and making settlements, a large number of ships have been needed; and many war ships have been required for the proper defense of her widely scattered colonies. Another reason for so large a navy is the fact that the British Isles are cut off from all other nations by water. For defense, therefore, the British must rely upon war ships rather than upon a standing army.

Further than this, the British are actually *forced* to own many ships. Here are over forty-five million people living on two small islands, from whose soil it is impossible to obtain the necessary food. They must send ships away for their flour, meat, sugar, tea, coffee, etc.; and they must send abroad for much of their raw materials for manufacture. Also, in order to pay for the raw materials and food, their manufactured goods must be shipped to all parts of the world; otherwise such extensive manufacturing would be impossible. From this it is plain why a very large number of vessels must be employed; and there are two reasons why the British, rather than other nations, should own them. In the first place, such trade is profitable; and secondly, when they own their own vessels, they can send them where and when they will, and are, therefore, independent in case of war.

These facts, coupled with the remarkable energy of the British, are the principal reasons why the United Kingdom greatly surpasses all other nations in number of war ships and merchant vessels.

Government of the United Kingdom

The government of the United Kingdom is a limited monarchy, the present ruler being King George V. We know that in the United States our general laws are made at Washington by a Congress composed of a Senate and a House of Representatives. In the United Kingdom the law-making body, which corresponds to our

Congress, is called *Parliament*. It is likewise composed of two bodies, the House of Lords and the House of Commons.

The *House of Lords* is made up of members of the nobility, or men with inherited titles, who are not elected by the people. The *House of Commons*, whose members are elected by popular vote, is the more important. Through them the people are able to make their own laws, and the government is therefore one that allows great freedom.

The sovereign corresponds to our President; but the execution of laws is really in charge of a *Cabinet*, composed of a *Prime Minister* and several other *Ministers*, who are responsible to the House of Commons for their actions. If the Ministers lose the support of the House, they are obliged to resign; and then others are appointed who will carry out the wishes of the people.

Review Questions

1. What remarkable facts can you state about the position, size, and importance of these islands? 2. How does the character of the inhabitants help to explain the importance of the islands? 3. How is the importance of the islands also partly explained by the prevailing winds? 4. By the character of the surface of the land? 5. By the irregular coast line? 6. By the natural resources? 7. Tell about the raising of live stock on these islands. 8. What are the other leading farm products? 9. Of what importance is fishing? 10. What important minerals are found? 11. What conditions greatly favor manufacturing? 12. What can you tell about the woolen manufacturing? 13. Cotton manufacturing? 14. Iron and steel manufacturing? 15. How does Ireland compare with Great Britain in prominence of agriculture? What are the farm products of Ireland? 16. How does Ireland contrast with Great Britain in mining? 17. In manufacturing? 18. What about the population of Ireland? 19. Name and locate the principal cities of the British Isles. 20. Tell further about the location of London. 21. Its early history and present size. 22. Its manufacturing and commerce. 23. Its importance in other ways. 24. Locate and state the important facts about other cities in the south of England. 25. In the north. 26. Tell about the leading cities of Scotland. 27. Of Ireland. 28. How has the British Empire come to have so many colonies? 29. So great a foreign commerce? 30. So great a navy and so many merchant vessels? 31. Describe the government of the British Isles.

Suggestions

1. Make a sketch map of Great Britain, showing the position of the highlands and lowlands, principal rivers and cities. 2. Considering the prevailing winds, which side of the great cities must be most free from smoke? 3. Why are sheep able to eat shorter grass than cattle? 4. Make a list of goods manufactured from flax, and place samples in the school cabinet. 5. Write a short paper telling in what ways the people of the British Isles and the United States depend on one another. 6. State ways in which New England and Great Britain resemble each other. 7. What names of British cities have you met in your study of the United States? In what portion of the United States are they? 8. Read in George Eliot's "Silas Marner" a description of old-fashioned manufacturing by hand looms. 9. Read in "John Halifax, Gentleman," an account of the introduction of steam into the factories. 10. What books written by Englishmen have you read? 11. What early English explorers took part in the exploration of North America?

III. The Netherlands, Belgium, and Luxemburg (Fig. 296)

Map study

1. Compare the area of The Netherlands with that of Belgium (p. 262); with that of Great Britain. 2. Compare the coast lines of The Netherlands and Belgium. 3. What large river crosses The Netherlands? Through what countries does it flow? 4. What countries border The Netherlands? 5. Belgium? 6. Make an outline map of these two countries.

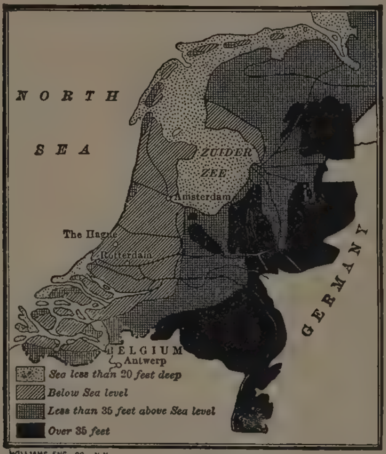
1. The Netherlands (Holland)

Surface features

Figure 289 shows The Netherlands to be a peculiar country. The greater portion is very low, and some parts are as much as fifteen feet below sea level. In fact, if protection against sea and river were not provided, about one half of the surface would be under water at least a part of the time. This explains why the country, sometimes called Holland, is more commonly known as *The Netherlands*, meaning *the low country*.

The Rhine has brought much of the soil;

some of it, no doubt, all the way from the Alps. A large part of the country is, in fact, a delta of sand and clay built by the Rhine. It is so low and level that, over much of the surface, the only notable elevations are either sand dunes, thrown up by the wind, or glacial moraines of sand and gravel. In Figure 270 notice how far the ice sheet advanced in this section. Hard rocks are found only in the extreme eastern and southeastern parts, where the highest point is a little over a thousand feet above the sea.



WILLIAMS ENG. CO., N.Y.

FIG. 289. — Map to show the portion of The Netherlands that is below sea level.

How the lowland has been reclaimed

As the population increased, and there was need for more land, it was found possible by building embankments, called *dikes*, to keep the high tides and rivers from overflowing the salt marshes and flood plains. The people have even undertaken the difficult task of reclaiming the shallow sea bottom itself. Such drainage began in the twelfth century and has continued until the present day. It has already about doubled the area of The Netherlands, and now a scheme is projected by which the Zuider Zee is to be reclaimed.

The first step in reclaiming a section of land is to build dikes around it. Then the water is pumped from the inclosure and emptied into the rivers, or into the sea. Windmills were formerly the only means for such pumping, and many are still in use (Fig. 290); but now many steam pumps are also used. These pumps must be worked all the time in order to keep out the rain water, as well as that which soaks through the soil.

Number and character of the people

It might seem that a country so small as this, and with such a surface, could not support a large population. Nevertheless, The Netherlands has about two thirds as many inhabitants as the remarkably productive state of New York, which is four times as large. They are a very prosperous people, too.

Agriculture is the principal industry of the

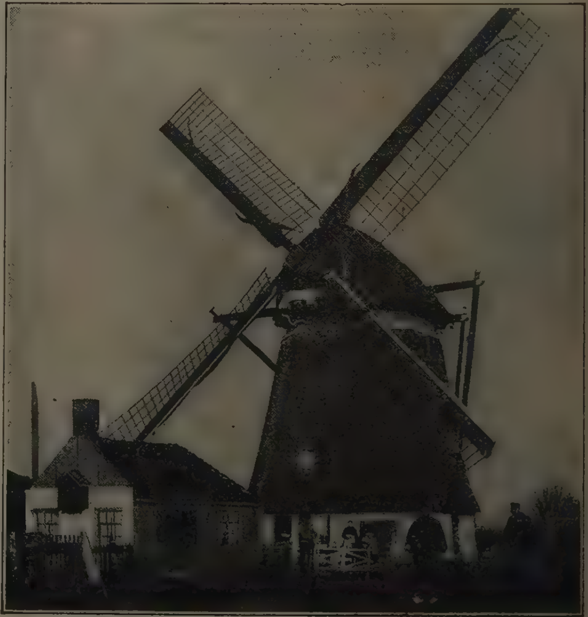


FIG. 290. — A Dutch windmill, used for pumping the water from the lowlands behind the dikes.

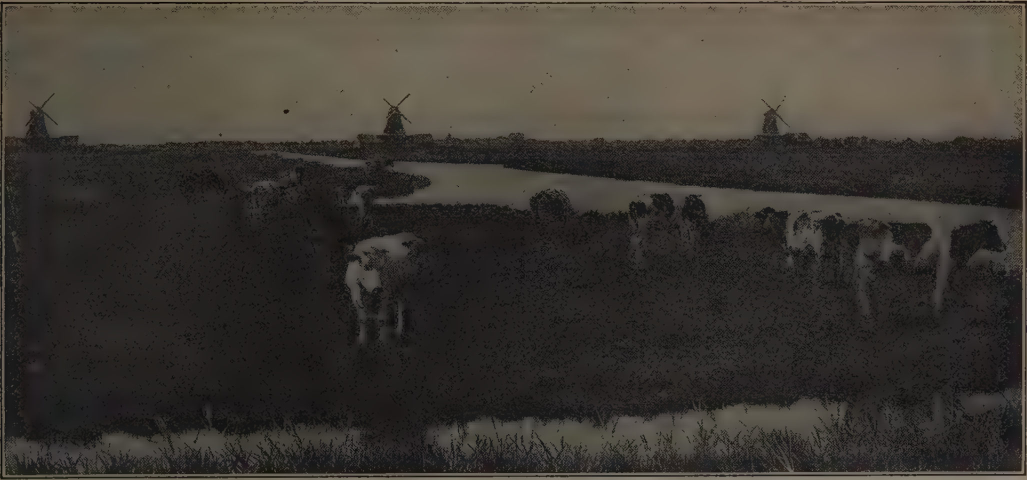


FIG. 291. — Cattle feeding in the rich pastures of Holland. A typical Dutch scene.

Kingdom. The leading farm products are grains, such as rye, oats, wheat, barley, and buckwheat. Potatoes, sugar beets, beans, peas, and flax are also grown. There are many gardens, including flower gardens where bulbs are raised. The Dutch raise such excellent bulbs that they are sold all over the world.

Agriculture

More land is devoted to pasture (Fig. 291) than to all these crops. This is partly because much of the higher land is too sandy for cultivation, and partly because the moisture in the lowlands aids in the growth of excellent grass. Cattle, hogs, sheep, and horses are raised in great numbers; and quantities of butter and cheese are made.

Fishing

Both the Zuider Zee and the North Sea, near at hand, contain many food fish; and this fact has made fishing an important Dutch industry.

Mining and manufacturing

In so level a country there can be little water power; and little mineral wealth is to be expected in a land made up of soft clays and sands. A poor grade of iron ore is found in the bogs, and a little coal is mined in the extreme southeast.

Under the circumstances, one might not expect much manufacturing. Fortunately, however, there is an abundance of coal near by in Belgium, Germany, and England. And, since the Dutch people require quantities of cloth, shoes, machinery, etc., they import both coal and some of the raw materials in order to manufacture for themselves.

Reasons for extensive commerce

1. Easy transportation

Commerce is highly developed for several reasons. In the first place, the ditches, built for the purpose of drainage, are also useful as canals; and these, together with the rivers, make transportation by water very easy to all sections of the country. Furthermore, the flat-topped dikes make excellent wagon roads; and the level nature of the land renders the building of railways a simple matter.

2. Position of Holland

A second reason for the importance of commerce is the *position of Holland.* This country lies directly in the path of entrance to northern Europe; and it is crossed by the Rhine River, which is navigable for a long distance through Germany. Therefore, much of the American and British trade with central Europe is carried on through Holland.

3. Its colonies

The Dutch colonies (Fig. 327) furnish a third reason for the extensive commerce. Since the very earliest times the Dutch have been in close contact with the salt water. Not only have they battled with the sea in reclaiming their land; but to visit some of their near neighbors they have been obliged to go by boat. The men have, therefore, become expert sailors; and when discoveries of new lands were being made, the Dutch sailors naturally took part. This, of course, was followed by the founding of colonies in distant lands.

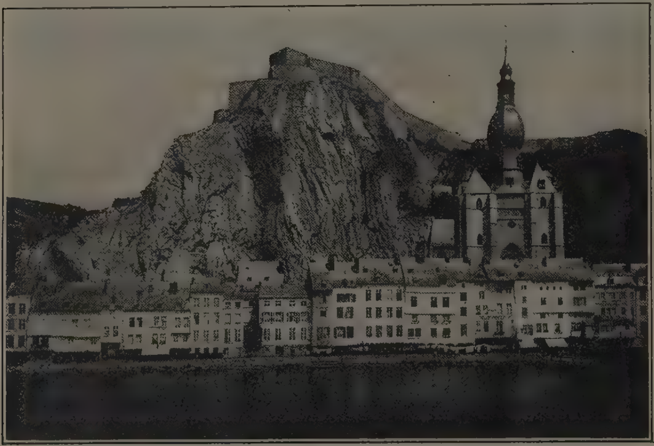


FIG. 292. — A view in the hilly southern portion of Belgium.

The attempt of the Dutch to colonize our Hudson Valley was stopped by the English; but Holland retains possession of other important regions. Of these, Dutch Guiana in South America has already been mentioned (p. 229); but the most important Dutch colonies are Java and several other East India islands (Fig. 327). The manufacture of raw products obtained from the colonies forms one of the principal industries of the coast cities.

Cities

AMSTERDAM and ROTTERDAM are the two principal cities. The former, the largest city in The Netherlands, is about the size of Baltimore. It is connected with the ocean by canal, and is noted for its university and museums, as well as for its shipping, manufacturing, and diamond cutting. The rulers of Holland are crowned at Amsterdam, although the royal family resides at THE HAGUE, where the government buildings are situated.

ROTTERDAM, next to Amsterdam in size, is the chief seaport of the Netherlands. Its location, near the mouth of the Rhine, makes it one of the principal ports for entrance to the interior of the continent. This explains why Rotterdam is the European terminus for some of the important steamship lines from New York and other parts of the world.

2. Belgium (Fig. 296)

Comparison of surface with that of Holland

In much of Belgium the surface of the land reminds us of Holland. The country is low and flat in the northern and western parts, but gradually rises, and grows more rolling toward the south and east. There is much more of this hilly land in Belgium, and the highest point (2230 feet) is more than twice that in The Netherlands.

Number and character of the people

Although Belgium is even smaller than Holland, its population is much larger, or over seven million. How does that compare with the population of New York State? Little Belgium is, in fact, the most densely populated country on the earth.

Agriculture

More than half the inhabitants are engaged in agriculture, the chief products, besides live stock, being grain, flax, hemp, fruit, and sugar beets. Among the farm animals, the Flemish horses are especially noted for their great size and strength.

The Belgian method of farming forms a striking contrast to that in the United States. Instead of farms with from one hundred to several thousand acres, as in our country, the Belgian farms usually contain not more than two or three acres. To a large extent, spading takes the place of plowing; and such hand labor, guided by the experience of many generations, secures large crops of the best quality. In spite of such careful cultivation of the soil, however, there are so many people in Belgium that much food has to be imported.

Mining and manufacturing

Quite different from the level northern plain, close set with farms and towns, is the hilly region of the southern angle, covered with forests. The weathering of ages, which has worn these mountains so low, has brought to light valuable mineral deposits, especially coal and iron ore. As in England, these two minerals occur near together. Lead, zinc, and silver are also found here; and there is much quarrying of marble and other building stones.

Belgium, therefore, possesses advantages for agriculture similar to those of Holland, while the minerals give far greater opportunity for manufacturing. These facts help to explain why the population is so dense. More than one hundred thousand men are engaged in mining, and coal and coke are among the leading exports of the kingdom.

The northwest slope of the hilly region is one of the world's busiest industrial regions. As in England, the three most important kinds of manufacturing are cotton, wool, and iron and steel. Linen and glass are also made. The country is so small, and there are so many waterways and railways, that coal is transported cheaply to all sections. Manufacturing, therefore, is well distributed over the kingdom, although coal is found only in the south.

Commerce

By its position Belgium secures many of the advantages that Holland enjoys; that is, it is a gateway to and from the interior of Europe. To be sure, its coast line is only about forty miles in length and the water there is shallow; but Antwerp has an excellent harbor on the broad lower course of the small Scheldt River.

Cities

Brussels, the capital and largest city, is situated in the heart of the kingdom. The name *Brussels carpets* suggests one of its industries; but carriage and lace making are at present among its most important kinds of manufacture. Brussels is an educational as well as a political and commercial center, having numerous picture galleries, museums, and schools.

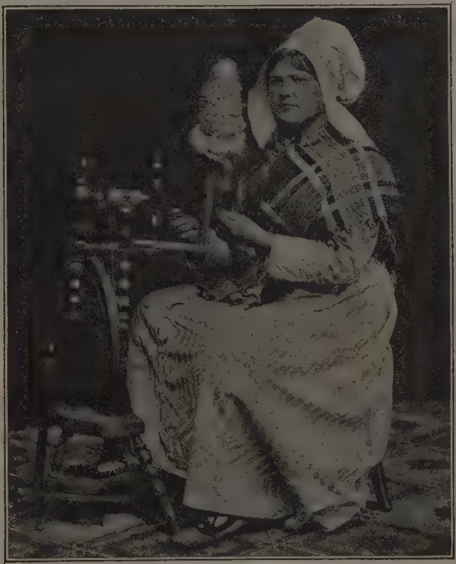


Fig. 293. — A Belgian woman working at the spinning wheel. There is much of this hand work in Belgium.

Antwerp, next in size, is some distance inland on the navigable Scheldt River. Some of the great steamship lines from New York have their European terminus here, and the port is one of the most important in Europe. The leading kinds of manufacturing are sugar refining, distilling, lacemaking, and shipbuilding.

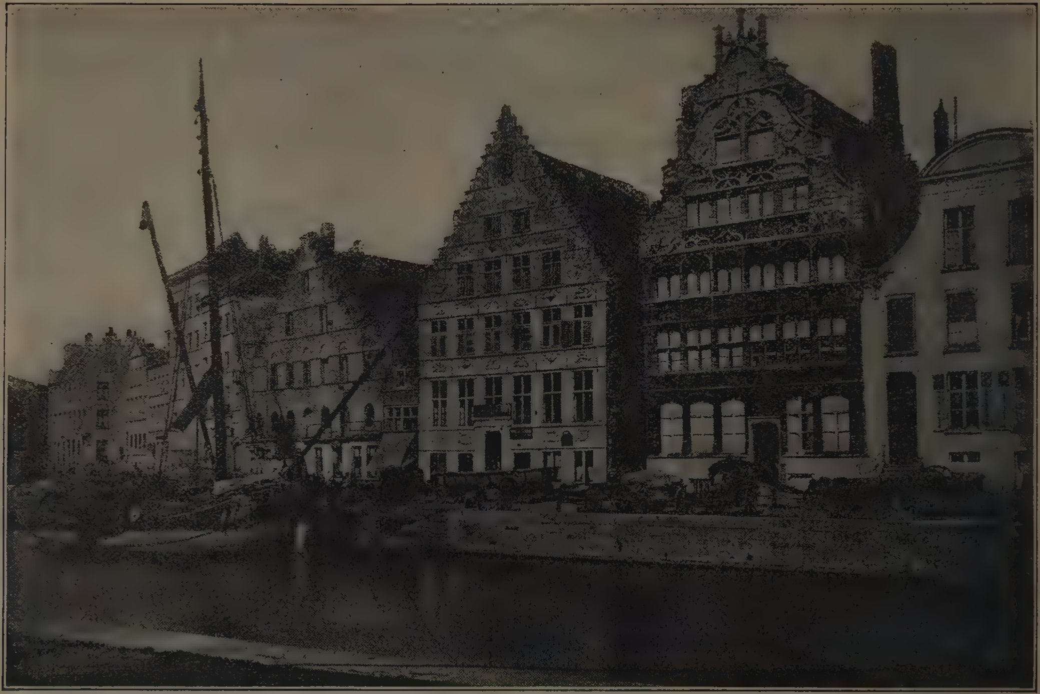


FIG. 294. — Some of the quaint houses of Ghent facing one of the canals on the low plain of northern Belgium.

Many other cities and towns are important manufacturing centers. The largest are LIÈGE, the "Birmingham of Belgium," engaged in the manufacture of firearms, cutlery, glass, and various kinds of machinery; and GHENT (Fig. 294), noted for linen and cotton goods, and for machinery.

3. Luxemburg

On the southeastern border of Belgium is the small duchy of Luxemburg, governed by an hereditary grand duchess and a Parliament. Like Belgium, by agreement of the Great Powers of Europe, it is neutral territory. Agriculture, iron mining, and manufacturing are the principal industries.

Review Questions

The Netherlands. 1. Describe the surface of Holland. 2. How has the lowland been reclaimed? 3. What can you say of the number and character of the people? 4. Tell what you can about the agriculture; about fishing. 5. About mining. 6. Account for the importance of manufacturing. 7. What reasons can you give for the extensive commerce of Holland? 8. Name and locate the principal cities.

Belgium. 9. Compare the surface of Belgium with that of Holland. 10. What about the number and character of the Belgian people? What kind of government have they now? 11. What is the condition of agriculture? 12. Of mining and manufacturing? 13. Of commerce? 14. Locate and state important facts about the cities. 15. Tell about Luxemburg.

Suggestions

The Netherlands. 1. Why are the winds likely to blow with special force and regularity across Holland? 2. Why is this fact of special value to the Dutch? 3. Find out more about the flower gardens of the Dutch. 4. Have you seen any Dutch pottery, especially Delft wares? 5. Find out why the Pilgrims did not remain in Holland instead of coming to America. 6. Why should not Rotterdam be as large a city as New York? 7. Find out about the Peace Conferences of 1899 and 1907 at The Hague. 8. What reasons are there for selecting a small country like

Waterloo a few miles South of Brussels

Holland for such a conference, and for making treaties between nations which have been at war?

Belgium. 9. There are greater extremes of temperature in Belgium than in England. Why? 10. Find out some facts about the battle of Waterloo. 11. Give several reasons for spading instead of plowing land. 12. Examine a piece of lace. From what material is lace made, and how is the work done? 13. Towns in Belgium are often known by two names. Why? 14. Figure out the number of persons per square mile (See Appendix, p. 390) in Belgium and compare it with the number in New York, or in your own state.

IV. FRANCE

Map study

1. France is the nearest country to the British Isles. Estimate the distance between the two. 2. Compare the two countries as to area. 3. As to population. 4. What countries border France? 5. What waters? 6. In what respects is its position favorable to commerce? 7. What do you observe about the general direction of the rivers? Name them. Locate the island of Corsica, which belongs to France.

People and government

The early inhabitants of France, called Gauls, were conquered by the Romans, who gave them their language and many of their customs.

After the fall of Rome, France was divided into independent kingdoms, which were often at war with one another or with neighboring countries. The natural boundaries of France have, however, tended to bring these kingdoms together; for the country is inclosed on two sides by the sea, and elsewhere, in large part, by mountains. Notice how completely the Pyrenees separate France and Spain; and what a barrier the lofty Alps form along the Italian and Swiss borders. Even north of the Alps, a part of the boundary is formed by highlands (Fig. 273).

While the inhabitants were thus partly protected from invasion, there were few barriers within France itself to keep the people of different sections apart. It was not difficult, therefore, to bring the several kingdoms under one rule.

Monaco in the southeast, and *Andorra* in the Pyrenees, are the only exceptions. The principality of Monaco, only eight square miles in area, is a noted winter resort because of its fine climate.

France has changed its form of government several times. For a long time it was a monarchy, and over a century ago it became a republic; but this did not continue long, for Napoleon Bonaparte became so powerful that he was made emperor. There have been other changes since then, the last one being in 1871, when the republican form of government was again established.

Surface features and rainfall

As we have seen, the chief highlands of France are in the south and southeast. Among these the loftiest are the Alps, whose

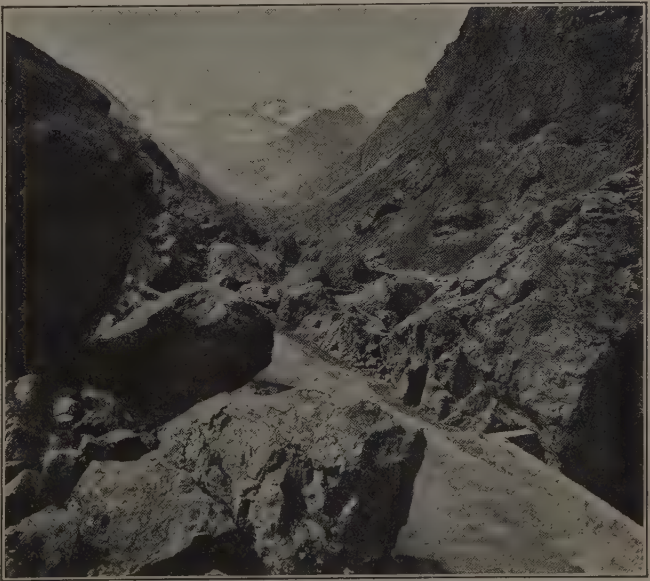


FIG. 295. — A road across the rugged Pyrenees which lie between France and Spain.

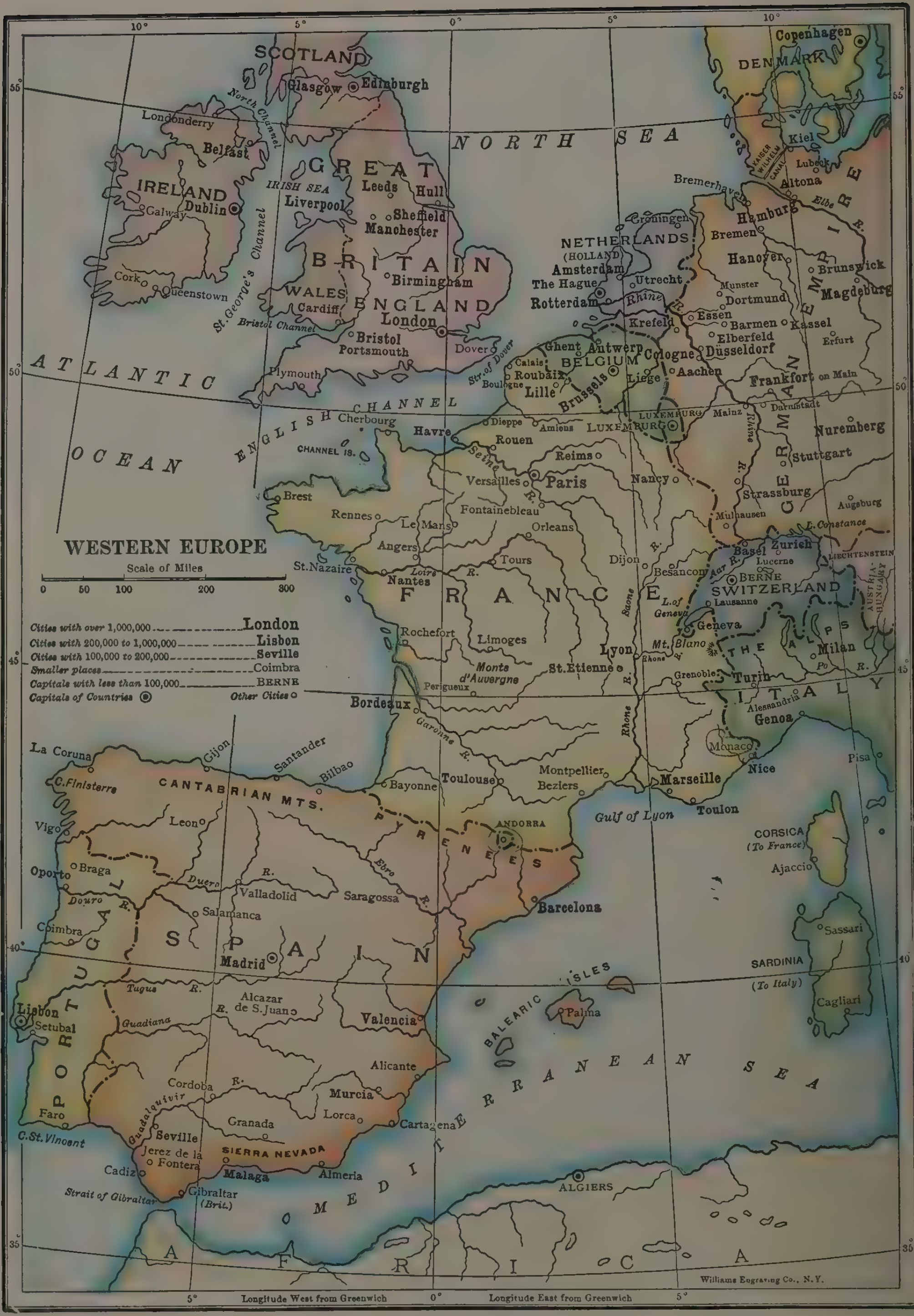

WESTERN EUROPE
Scale of Miles
0
50
100
200
300
Cities with over 1,000,000
London
Cities with 200,000 to 1,000,000
Lisbon
Cities with 100,000 to 200,000
Seville
Smaller places
Coimbra
Capitals with less than 100,000
BERNE
Capitals of Countries
Other Cities
10°
5°
0°
5°
10°
55
50
45
40
35
Longitude West from Greenwich
Longitude East from Greenwich
SCOTLAND
Glasgow
Edinburgh
North Channel
Londonderry
Belfast
IRELAND
Dublin
Galway
Cork
Queenstown
St. George's Channel
IRISH SEA
GREAT BRITAIN
Leeds
Hull
Liverpool
Sheffield
Manchester
Birmingham
WALES
Cardiff
Bristol Channel
ENGLAND
London
Bristol
Portsmouth
Dover
Plymouth
Str. of Dover
NORTH SEA
ATLANTIC OCEAN
ENGLISH CHANNEL
CHANNEL IS.
Copenhagen
DENMARK
KAISER WILHELM CANAL
Kiel
Lubeck
Altona
Bremerhaven
Elbe R.
Hamburg
Bremen
Groningen
NETHERLANDS (HOLLAND)
Amsterdam
The Hague
Rotterdam
Utrecht
Rhine
Hanover
Brunswick
Magdeburg
Munster
Dortmund
Essen
Barmen
Kassel
Elberfeld
Krefeld
Erfurt
Düsseldorf
Cologne
Aachen
Ghent
Antwerp
BELGIUM
Calais
Roubaix
Boulogne
Lille
Brussels
Liege
Frankfort on Main
GERMAN EMPIRE
LUXEMBURG
LUXEMBURG
Mainz
Darmstadt
Nuremberg
Stuttgart
Strassburg
Augsburg
Mulhausen
L. Constance
Cherbourg
Havre
Dieppe
Amiens
Rouen
Seine R.
Reims
Versailles
Paris
Nancy
Brest
Rennes
Le Mans
Fontainebleau
Orleans
Angers
St. Nazaire
Nantes
Loire R.
Tours
Dijon
Besancon
FRANCE
Saone R.
Basel
Zurich
Lucerne
Aar R.
LIECHTENSTEIN
AUSTRIA-HUNGARY
BERNE
SWITZERLAND
Lausanne
L. of Geneva
Geneva
Mt. Blanc
THE ALPS
Milan
Po R.
Rochefort
Limoges
Monts d'Auvergne
Lyon
Rhone
St. Etienne
Grenoble
Turin
Perigueux
Bordeaux
Garonne R.
Rhone R.
ITALY
Alessandria
Genoa
Monaco
Nice
Pisa
La Coruna
Gijon
Santander
Bilbao
Bayonne
Toulouse
Montpellier
Beziers
Marseille
Toulon
C. Finisterre
CANTABRIAN MTS.
PYRENEES
ANDORRA
Gulf of Lyon
CORSICA (To France)
Ajaccio
Vigo
Leon
Oporto
Braga
Duero R.
Douro R.
Valladolid
Saragossa
Ebro R.
Salamanca
Barcelona
Coimbra
SPAIN
Madrid
Sassari
SARDINIA (To Italy)
Cagliari
PORTUGAL
Tagus R.
Lisbon
Setubal
Guadiana R.
Alcazar de S. Juan
Valencia
BALEARIC ISLES
Palma
Alicante
Cordoba
Guadalquivir R.
Murcia
Lorca
Faro
Granada
Cartagena
C. St. Vincent
Seville
Jerez de la Fontera
SIERRA NEVADA
Cadiz
Malaga
Almeria
Strait of Gibraltar
Gibraltar (Brit.)
ALGIERS
MEDITERRANEAN SEA
AFRICA
Williams Engraving Co., N.Y.

FIG. 296.

highest peak, Mont Blanc (15,781 feet), is in France. Since there are no mountains in the western part of the country, the west winds are able to bear vapor to all parts of France, thus supplying all sections with an abundance of rain for agriculture.

The position of the highlands is favorable to commerce as well as to farming. Fully three fourths of France is a plain, sloping westward from the low central plateau. All but one of the large rivers rise in this plateau, and flow gently across the plain to the Atlantic. Thus navigation is possible far into the country. Locate and name the four largest rivers. How does the Rhone differ from the other three?

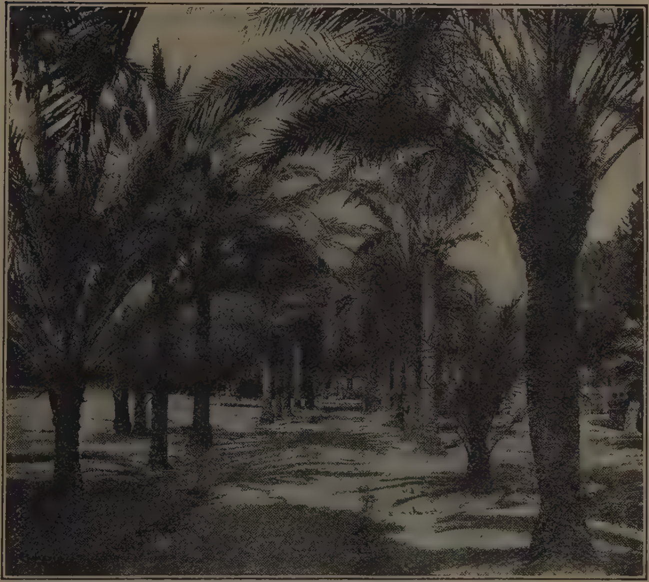


FIG. 297. — A view in Nice showing the semi-tropical foliage of southern France.

Temperature

As might be expected, the summers are warmer than in England, since France lies almost entirely south of that country, and is less under the influence of the ocean. The southeastern section, although it lies as far north as Boston, has a semi-tropical climate (Fig. 297). This is because of the warm Mediterranean waters, and the protection from cold north winds afforded by the mountains (pp. 244 and 265).

FIG. 298. — Piles of silkworm cocoons ready to be unwound.

Agriculture

1. Crops

With so favorable a climate, and so much level land, France has naturally become a farming country. Nearly half the people are engaged in agriculture. The same grains are raised as in England. What are they (p. 249)? Wheat is the most important, and more of this grain is produced than in any other European country excepting Russia. Yet France raises only about half as much wheat as the United States, and not nearly enough for the needs of her people.

Grapes, not important in the British Isles, thrive in the warmer climate of central and southern France. This fruit is the most valuable of all French crops, and more grapes are grown in France than in any other country except Italy. In the Rhone

Valley, and on the warm Mediterranean coast, there are groves of olive, orange, and mulberry trees. The leaves of the latter furnish food for the silkworm (Fig. 298).

2. Live stock

As in England and other countries, the highlands are unsuited to cultivation, and are in large part given over to grazing. As in England, too, there are broad tracts of lowland that are used for pasture. These facts explain why there are more than fourteen million cattle and eighteen million sheep in France.

Mining

France is inferior to the British Isles in mineral products. Coal is the most valuable mineral; but while Great Britain, after supplying her many factories, has a large amount of coal left for export, France has to import some. The principal coal beds lie close to Belgium. They are, in fact, a continuation of the coal deposits of that country. Small coal beds are found at other points, as near St. Etienne.

A small quantity of iron is produced, mainly in the northeast near the coal fields. Fine clays for porcelain are found in central France, and building stones are quarried in many places.

Manufacturing

1. Why very extensive

In spite of the limited supply of fuel, France is a great manufacturing nation. It ranks fifth in the production of silk, second in the production of wine, and there is extensive manufacturing of metal, cotton, and woolen goods. One reason for these manufactures is the fact that coal is easily obtained, either in France or from Belgium, Germany, and England.

Another reason is found in the nature of the people themselves. Frenchmen have a peculiar appreciation of what is graceful, delicate, and elegant. This is illustrated by the fact that so many of our fashions in dress come from France; and a gown, a pair of gloves, or a hat from Paris is expected to be a trifle more desirable than one bought elsewhere. On this account the French have given much attention to the manufacturing of the finer kinds of goods. Thus their artistic taste has had great influence upon both the kind and amount of their manufacturing.

2. Leading kinds

(1) ***Woolen and cotton manufacturing***

The northern part of France, including Lille, Roubaix, and Reims, as well as cities near the mouth of the Seine, is the section especially noted for the woolen industry. Here coal is most easily obtained; and large numbers of sheep are raised on the hills and plains near by, while foreign wool from Argentina and Australia is easily imported at Havre and at the Belgian port of Antwerp. Remembering that the hosiery, carpets, underclothing, and other goods are of high grade, and such as wealthy people wish, we see that this location, between the two wealthiest capitals of the world, is especially favorable. Next to silk goods, woolen cloths form the most important French export to Great Britain.

There is also much cotton manufacturing near the coal fields of northern France. An important reason for such work in this section is the ease with which American cotton may be imported; and this explains why Rouen, on the Seine, is a center for cotton goods. There are cotton factories in eastern France, also, where water power is used instead of steam power. Why should you expect water power in that section?

(2) ***Silk manufacturing***

Because the climate and soil of the Rhone Valley are favorable to the growth of the mulberry tree, and because coal mines are near by, this section is a great silk-manufacturing region. Lyon is the center, but St. Etienne and Paris are also noted for this industry. Some of this manufacturing is done in large factories, some in the homes of the workmen where hand and foot power are used in place of steam.

The extensive cultivation of grapes has been mentioned. Great quantities of grapes are made into wine for export or for use in France. In that country nearly every one drinks wine at his meals, or wine mixed with water.

(3) *Other manufacturing*

The manufacture of steel goods is important in some places, but to no such extent as in Great Britain. Other kinds of manufacturing are mentioned under the cities.

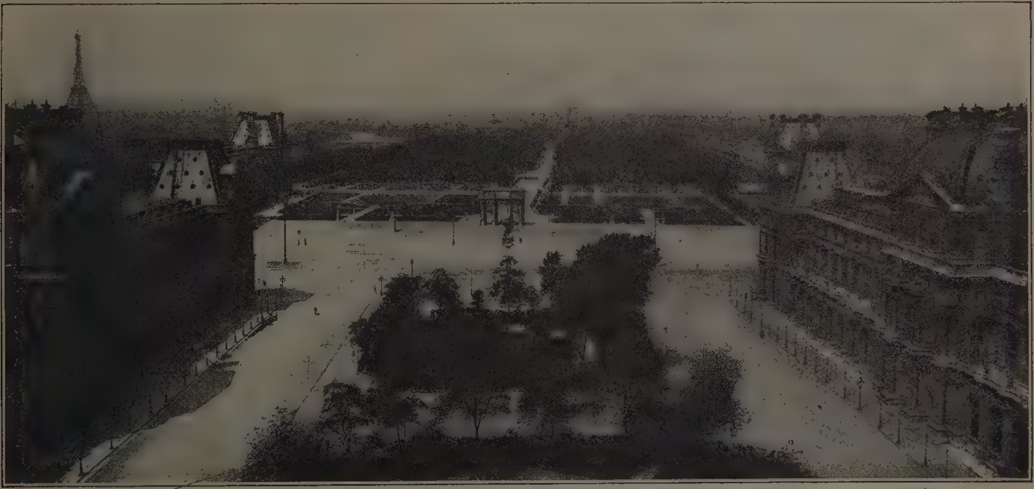


FIG. 299. — A view in Paris showing the broad streets and parks.

Principal cities

1. Paris

PARIS, the capital of France, is the largest city on the continent of Europe, and the third largest in the world. It numbers more than 2,840,000 inhabitants.

(1) *Importance of its location*

Paris is situated on the Seine at a point where there is a small island in the river. This island was once a good place for defense, and also an important aid in bridging the river. The location is especially favorable to the growth of a large city, for several reasons. The Seine, having a slower current than the Rhone, and being less subject to overflows than the Loire, is more easily navigable than any other river in France. Its upper tributaries, too, bring Paris into close touch with eastern France; and, by the aid of canals, there is water connection with the Loire and Saone also, and with the Rhine in Germany. Furthermore, Paris is situated on the main trade route from the Mediterranean to northern and central France, which follows the Rhone, the Saone, and the Seine. Finally, Paris is located in the midst of the most fertile portion of the country, and not very far from several other densely populated countries. For all these reasons it has always been the principal French city.

(2) *Its importance as an art center*

Reference has already been made to the artistic taste of the French. Napoleon and other rulers collected art treasures from various nations, and founded museums and schools which have made Paris famous. This explains why large numbers of Americans go to Paris every year to study art.

(3) *Its manufactures*

Like other great cities, Paris has many manufacturing industries. The superior taste of the Parisians has led them to pay especial attention to the manufacture of articles which combine usefulness with beauty, such as jewelry, furniture, gloves, and fashionable shoes. The Sèvres porcelain is made in the suburbs of Paris; and both this and the Limoges ware, manufactured at LIMOGES, are celebrated for their beauty.

(4) *Its commerce*

Although so far inland, Paris ships more goods by water than any other French city. The extensive system of canals, by which the country is crossed in all directions, has already been mentioned (p. 269). Vast sums have been spent in dredging the lower Seine, so that the depth of water between Rouen and Paris now exceeds ten feet. Small vessels can proceed directly to Paris; but larger ships transfer their goods to trains, or smaller boats, at HAVRE and ROUEN. Railway transportation is also well provided for, since the chief railways of France radiate in all directions from Paris. Altogether, therefore, Paris is the political, artistic, manufacturing, and commercial center of France.

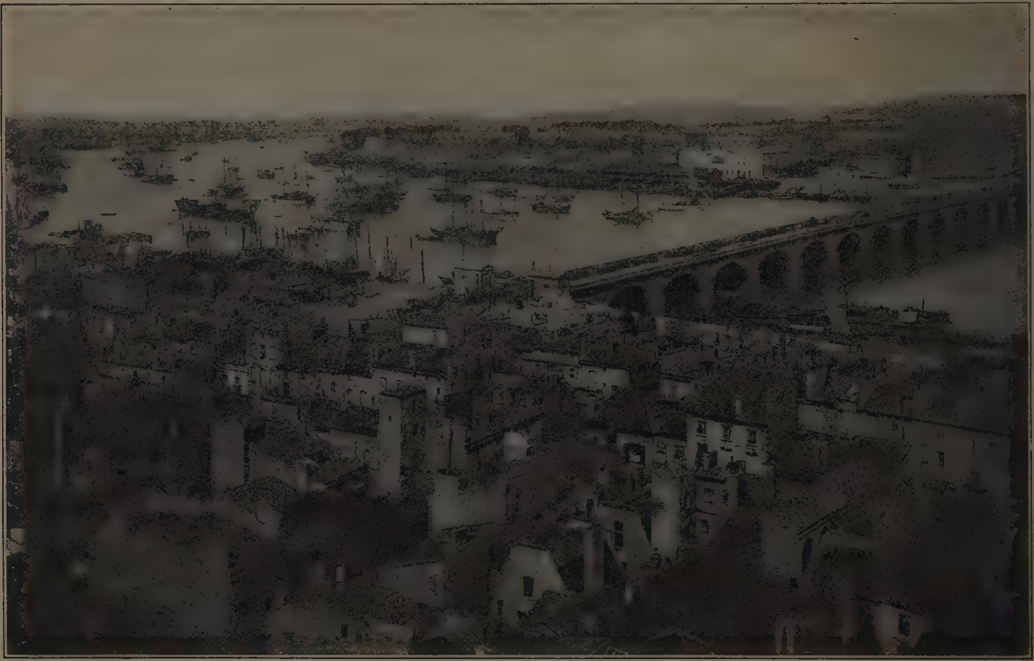


FIG. 300. — A part of Bordeaux and the Garonne River.

2. Other cities

(1) *Havre, Boulogne, and Calais*

HAVRE, which is almost as busy a port as Marseille, has an extensive trade in coffee from Brazil, and in wheat and other materials from the United States. Farther to the northeast is BOULOGNE, where some of the American steamships stop; and not far distant is CALAIS, the nearest port to England, where boats cross the Strait of Dover to England.

(2) *Bordeaux and Lyon*

BORDEAUX, on the Garonne River (Fig. 300), in the midst of a fertile grape-raising district, is the chief port for the export of French wines. Locate the cities previously named (pp. 268 and 269), and tell for what each is important. Note especially LYON, the center of the silk industry of France.

(3) *Marseille*

The leading seaport of France on the Mediterranean is MARSEILLE, located near the mouth of the Rhone. The delta of the Rhone is too marshy for a city, and Marseille occupies the nearest point where there is a good harbor and high ground. For many centuries the Rhone Valley was the principal gateway from the Mediterranean to central Europe, and it is natural, therefore, that a city should grow near the mouth of the Rhone River. One route leads to the Seine Valley, and thence to Paris (p. 269), northern France, and Belgium. Another ancient route of travel enters Switzerland past Lake Geneva, out of which the Rhone flows; and still a third route leads, through an opening in the mountains, into the Rhine Valley and Germany.

French colonies

On the other hand, France has taken a leading part in the exploration and settlement of new lands. You will remember that the French formerly had extensive possessions in North America. Where were they? Where are her present colonies in the New World (Fig. 327)?

In Asia, France holds a part of Indo-China and a very small bit of India; and she owns numerous islands in different portions of the world (Fig. 327). Her most important colonies at present are in Africa, as follows: (1) Algeria and Tunis, across the Mediterranean; (2) a vast area south of these countries, including a large part of the Sahara Desert, the Sudan, the upper Niger, and the country north of the Congo River; and (3) the large island of Madagascar, east of southern Africa.

Review Questions

1. What can you tell about the people and government of France? 2. Locate Monaco and Andorra. 3. Describe the surface of France; the climate. 4. What about agriculture there? 5. Mining? 6. Why is manufacturing extensive, in spite of lack of fuel? 7. Tell about the woolen and cotton manufacturing. 8. Silk manufacturing. 9. Other manufacturing. 10. Explain the importance of the location of Paris. 11. Show how Paris is important as an art center. 12. As a manufacturing center. 13. What about its commerce? 14. Locate and state the important facts about other cities in France. 15. Name and locate the principal colonies of France.

Suggestions

1. What is the name of the president of France? 2. Give reasons why one river, such as the Loire, might be much more subject to overflows than another, such as the Seine. 3. Examine Figure 270 to see if the glacier reached into any part of France during the Glacial Period. 4. Raise a silkworm from the egg. 5. Examine a cocoon, and see if you can unravel some of its thread. 6. Also unravel a piece of silk goods and examine the threads. 7. What influence have the railway tunnels through the Alps probably had upon the commerce of Marseille? 8. The Suez Canal? Why? 9. Draw an outline of France, with the principal mountains, rivers, and cities.

V. SPAIN AND PORTUGAL (Fig. 296)

Map study

1. What cities in the New World are in about the same latitude as Madrid (Fig. 296)? 2. Compare the area of the Spanish Peninsula with that of France (Appendix, p. 390). 3. Compare the populations (Appendix, p. 390). 4. Compare the directions taken by the rivers (Fig. 272). 5. Judging from the map (Fig. 296), what about the probable number of good harbors? 6. What has been stated about the temperature and rainfall in Spain? 7. What islands in the Mediterranean Sea belong to Spain?

The highlands
1. Their extent

Many of the important facts about Spain and Portugal are explained by the elevation of the land. On the northern boundary stand the Pyrenees (Fig. 295), continued on the west by the Cantabrian Mountains, while in the extreme south are the lofty Sierra Nevada ranges (Fig. 272). Between these two mountain systems is a broad plateau, two or three thousand feet above sea level, broken by numerous short mountain ranges (Fig. 273).

In the Ebro Valley on the northeast, and the Guadalquivir (meaning Great River) Valley on the southwest, there are lowlands. Point to these rivers on the map (Fig. 296). The only other extensive lowland is a narrow strip near the sea, which reaches most of the distance around the peninsula. A very large portion of the surface, therefore, is made up of plateaus and mountains.

The highlands have an important in-

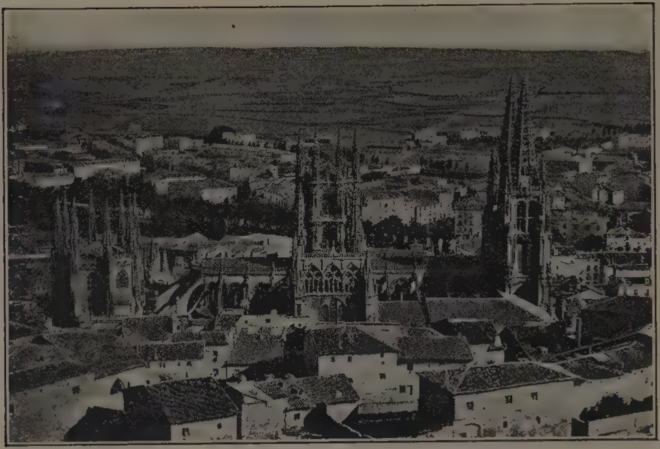


Fig. 301. — A village on the plateau of Spain.

2. Their influence on climate

fluence on the climate. Owing to the elevation of the land, the interior has cold winters, though the summers are hot; and because of the fringe of mountains, the rainfall is light everywhere except near the northwestern coast. Here the ocean winds lose their moisture in rising over the slopes, and thus cause abundant rainfall (Fig. 275). The southern portion of Spain, like Southern California, is in the horse latitudes (p. 197); and here the climate is so arid that irrigation is necessary for agriculture.

3. Their influence on commerce

The position of the Spanish Peninsula, between the two busiest seas of the world, and between Africa and central Europe, suggests that it might be a natural route for commerce between the two continents. But the highlands *separate*, rather than unite, these regions, so that the Spanish Peninsula has never been a great thoroughfare for the transportation of goods.

In one respect the elevation of the land is an advantage because it causes great variety of climate, and hence many kinds of farm products. What countries of South America does this condition call to mind?

Agriculture

1. Grazing

In such a country we may expect grazing in the uplands and along the mountains; and Spain is, in fact, noted for the excellent grade of its sheep and mules. There are also many cattle, especially in the rainy northwest; but the fact that so much of the country is arid explains why there are many more sheep and goats than cattle. The sheep often wander about in large flocks, sometimes as many as ten thousand together, under the care of a number of shepherds and their dogs. In summer they feed among the mountains, but in winter they are driven down to the more protected lowlands for shelter.

2. Farming

Wheat is the most common farm crop in Spain, since it requires little rain; but many of the farmers are so unprogressive that less wheat is raised than might be. In many of the valleys, where irrigation is possible, and on the lowlands along the coast, the farmers are more progressive and prosperous. Barley,

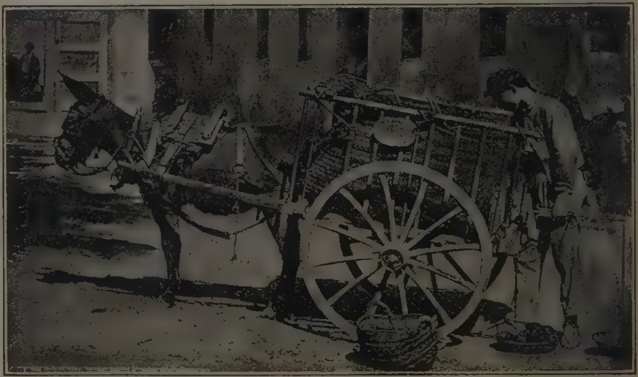


Fig. 302. — A Spanish peasant bringing vegetables to market in his donkey cart.

rye, and corn are grown, in addition to wheat, and these are among the staple foods of the people. Quantities of grapes are also raised in Spain and Portugal; and in the southern part of the peninsula the bark of the cork oak is a source of income to both countries.

The arid southeastern coast is wonderfully productive. One reason for this is the warm climate, due to the Mediterranean; another is the number of mountain streams, which, though useless for navigation, are very valuable for irrigation. Some of the products of this section, besides wheat and corn, are cotton, grapes, olives, figs, dates, oranges, lemons, and rice. Several crops of some products may be raised in a year.

Mining

The Spanish Peninsula is remarkably rich in minerals, lead, silver, copper, and *quicksilver*, or mercury, being among the most important. Spain produces more quicksilver than any other country, and is exceeded only by the United States in the output of copper and lead. Coal and iron ore are also found in several parts of the peninsula, but the coal is of no great value. The iron, which is mainly found on the northern slope of the Cantabrian Mountains, occurs in large beds, and is very valuable.

In mining, as in other industries, the unprogressive character of the people prevents proper development of the resources. Much of the benefit from the mines is due to the capital and enterprise of foreigners rather than to the Spaniards.

Manufacturing

From what has been said above, it is plain that manufacturing does not flourish. This fact is all the more evident when we consider that more than two thirds of the Spaniards and three fourths of the Portuguese cannot read. A nation so backward can hardly be expected to have developed extensive manufacturing. Thus, although they have some coal and could easily import more, much of their iron ore is shipped to the coal fields of Great Britain instead of being smelted at home. In some places, however, as will be seen in our study of the cities, there is extensive manufacturing.

Principal cities of Spain

1. Madrid and vicinity

MADRID, the capital and metropolis of Spain, has over a half million inhabitants; but unlike most other large cities so far studied, it is not an important manufacturing center. The reasons for its size are its central location, and the fact that it is the seat of the government. All the principal railway lines crossing the peninsula, to connect the coastal cities, converge at this point.

2. Granada

Another place of note among the highlands of Spain is GRANADA, the last stronghold of the Moors, who invaded Spain, from Africa, centuries ago. To this point among the mountains, at the crossing of the best routes of travel, from east to west, and from north to south, the Moorish people withdrew. Here they were able to hold out against the Spaniards for two hundred years, and the city grew to a population of four hundred thousand. At present, Granada contains less than one fifth as many inhabitants, and its principal attraction is the Moorish palace, or *Alhambra* (Fig. 303), one of the finest examples of Moorish architecture.

3. Other cities in southern Spain

On the lowlands west of Granada are SEVILLE and CADIZ, both flourishing cities in former days, when vast stores of plunder were brought from Spanish colonies in the New World. CADIZ is now a fortified naval harbor; and SEVILLE is recovering some of her former commercial importance. It has some manufacturing, especially of tobacco; and in one factory about five thousand women are employed in making cigars and cigarettes.

MALAGA, which has one of the warmest climates in Europe, is engaged in the ship-

Fig. 303. — The Court of Lions in the Alhambra.

ment of wine, raisins, and grapes. Of what grape does the name remind you?

4. Gibraltar

Gibraltar, a steep hill, with bold cliffs rising on nearly all sides, and with a town at its base, has belonged to England since 1704. This hill of solid rock (Fig. 304) is, perhaps, the strongest fortification in the world, and guards the entrance to the Mediterranean. Why should the English especially want such a stronghold here?

5. Principal seaports

On the whole, Spain is poorly provided with harbors; and while the majority of the people dwell near the coast, they take a small share in foreign commerce. Barcelona and Valencia are the leading seaports. Barcelona, the second Spanish city in size, is the more important port and is a textile manufacturing center as well. The region about Valencia is a beautiful garden, much like that around Los Angeles in southern California. The two sections are quite alike both in climate and products. Name some of these products (p. 119). In addition to the products of southern California, rice is grown on the lowlands near the coast.

Colonies of Spain

The only remnants of her vast foreign possessions now left to Spain are mainly in Africa. These include a few small settlements on the coast of Morocco; a portion of the western coast of Sahara, having little value; and a coastal strip and a few small islands in the Gulf of

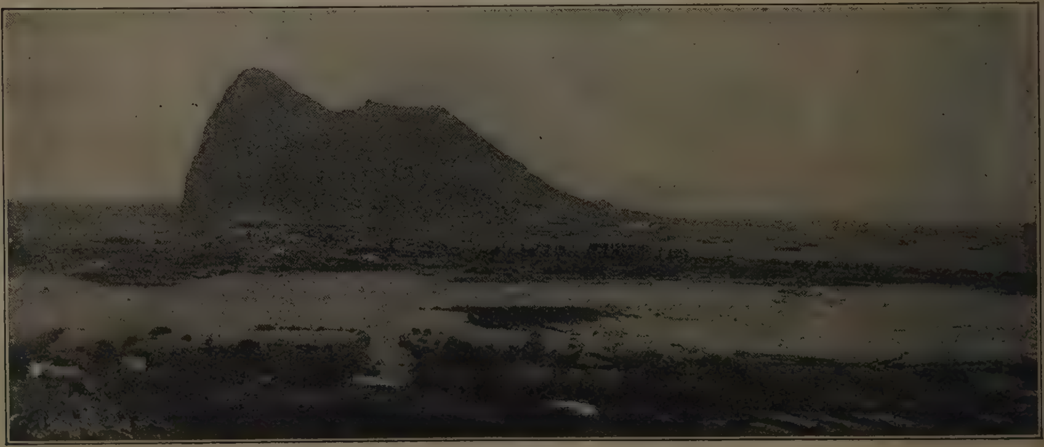


Fig. 304. — The rock of Gibraltar, seen from the Spanish mainland.

Guinea. The Canary Islands, west of the northern coast of Africa, and the Balearic Isles, in the Mediterranean, also belong to Spain.

Government

At present Spain is a limited monarchy; but in 1910 Portugal drove the king away and became a republic.

Principal cities of Portugal

LISBON and OPORTO are the chief cities of Portugal. The former, the capital and metropolis, is a very beautiful city. It lies on a broad bay where the Tagus River enters the sea, and has one of the finest harbors in existence. OPORTO gives the name to port wine. The lower part of the Douro Valley is one of the richest wine districts in Europe; and Oporto is an important point for its export.

Colonies of Portugal

Portugal, like Spain, has lost much of her foreign territory. The Azores Islands, far to the west in the Atlantic, and the Madeira Islands, to the southwest, are a part of the kingdom. The Cape Verde Islands, off the west coast of Africa, are also dependencies. In addition, Portugal has large possessions in Africa, and some small ones in Asia.

Review Questions

1. State the extent of the highlands. 2. What influence have the highlands on the climate? 3. Explain the influence of the highlands on commerce. 4. State the main facts about the grazing. 5. Name the farm products. 6. What minerals are found? 7. Why is manufacturing of so little importance? 8. State facts about Madrid and vicinity. 9. About Granada. 10. Locate and state the important facts about other cities in southern Spain. 11. For what is Gibraltar important? 12. Tell about the principal seaports of Spain. 13. Name and locate the colonies of Spain. 14. Locate the principal cities of Portugal, and tell for what each is important. 15. What colonies has Portugal?

Suggestions

1. About what portion of the boundary line between Spain and Portugal is formed by rivers? 2. What must be the influence of railways upon the old-fashioned methods of farming in the interior of Spain? 3. Learn what is meant by the Pillars of Hercules. 4. Find pictures of Moorish architecture. 5. Read Washington Irving's "The Alhambra." 6. Make a sketch of the Spanish Peninsula, including the principal mountains, rivers, and cities.

VI. NORWAY, SWEDEN, AND DENMARK (Fig. 315)

Map study

1. The Scandinavian Peninsula is the largest in Europe. What is its length in degrees (Fig. 315)? In miles? 2. How does its western coast remind you of the western coast of Scotland and Ireland? 3. What proofs do you see of glacial action? Where? 4. What do you observe about the rivers of Sweden? 5. Which of these three countries has the largest population? 6. How does it compare with New York State in area and population? With your own state? (See Appendix, pp. 391 and 392.) 7. What points in North America have about the same latitude as Christiania and Stockholm? 8. On Figure 229 find how near to Scandinavia the west wind drift reaches. 9. Locate Denmark; point out the islands that form a part of the country. 10. At the entrance to what sea does Denmark lie?

Some reasons for the independence of these countries

In these three countries together there are only about one fourth as many inhabitants as in the much smaller British Isles. Yet in spite of frequent European wars, they have remained independent through many centuries.

1. Their position

This has been possible, in part, because of their peculiar position. The only approach to Scandinavia by land is through Lapland in Russia, which is so far north that it has a very cold climate. Thus the peninsula is almost as isolated from other nations as is Great Britain.

The peninsula of Denmark, on the other hand, is partly connected with Germany (Fig. 315). The islands, however, which are the most important parts of Denmark, are completely cut off from neighboring lands. Standing, as it does, at the entrance to the Baltic Sea, Denmark guards the approaches to this inland sea. Both Germany and Russia have long coveted little Denmark on this account. But since neither of them has been willing that any other Great Power should hold it, Denmark has remained free. Thus the very importance of its position has protected it.

2. Their rugged surface and severe climate

The rugged surface and severe climate of Scandinavia have likewise protected it from invaders. From its southern to its northern end, the peninsula is mountainous, for it is an ancient mountain land (p. 238), much worn, and crossed by deep valleys. Some peaks reach an elevation of six to eight thousand feet; but most of them are lower and rise to nearly the same height, giving to the upland the appearance of a plateau. The mountains descend steeply into the ocean on the western side, so that, in all but the southern part, Norway is a narrow, mountainous country crossed by short streams flowing in deep, steep-sided valleys. The boundary between northern Norway and Sweden follows the divide between the east- and west-flowing streams.

Fig. 305. — Peasants of Norway in their native dress.

Although Denmark has no mountains, much of the land is sandy and barren. That all three of the countries have a severe climate is shown by the fact that even Denmark, the most southerly, lies about as far north as Scotland.

The agricultural districts

The west winds that blow from over the warm ocean exert a great influence here, as in the British Isles. Most of Norway, however, is too rugged and cold for farming. Out of a total area of about one hundred and twenty-four thousand square miles, less than four thousand have a soil and climate suitable to agriculture or pasturage. Sweden has much more low land, because the slope on the east side of the mountains is much the longer. Yet these lowlands are so far north, and so cut off by the mountains from the influence of the sea, that agriculture is of little importance anywhere except in the southern half of the country.

The northern and western portion of the Danish peninsula, called Jutland, is a sandy waste. Therefore only the islands and the southeastern part of Jutland are very productive. As a result of these conditions, the amount of land suitable for agriculture in the three countries is very small. The best sections are near together in southern Norway and Sweden and in eastern Denmark.

Industries and cities of Norway

1. The less important industries

Since Norway has so little land that is suited to farming or pasturage, the amount of stock and grain produced is small. Therefore, much meat, flour, and other food must be imported. There are some silver and copper mines, but coal is entirely lacking. Manufacturing, therefore, is not greatly developed. Even the fine water power is little used, because raw products for manufacturing are not abundant.

2. The three leading industries

On what, then, do the two million Norwegians depend for a living? They have two very valuable resources, — lumber and fish. More than one fifth of the country is forest-covered, pine being the most common tree. As in Maine, the rapidly flowing rivers are of use in moving the logs from the forest, and also in supplying power for the sawmills and planing mills. Lumber, wooden goods, and paper are the most important exports of the country.

Fish abound on the shallow banks along the irregular western coast, especially codfish in the neighborhood of the far northern Lofoden Islands. The North Sea, with its many fish, is also close at hand, and the Arctic Ocean with its seals and whales. Over a hundred thousand Norwegians are engaged in the fishing industry. Along the fiords every family owns a boat, and knows how to make one as well as how to use it. While the men are at sea, the women work the small farms or garden patches.

Centuries of experience in navigating the deep fiords, and in fishing, have bred in these people a love for the sea, which has given rise to a third great industry,—that of carrying goods for other nations. The timber for wooden vessels is easily supplied, so that they can be cheaply built. At present this small Norwegian nation has a greater *number* of freight vessels than any other European country except the United Kingdom.

3. Cities

All these facts together explain why the Norwegian towns lie along the coast. Indeed, it is rare to find even a village in the rugged interior. CHRISTIANIA, the capital and largest city, is situated at the head of a long, narrow bay, which makes an excellent harbor. This city is the principal seaport and distributing center for southern Norway. BERGEN, the next city in size, is an important fishing port, like Aberdeen in Scotland, and Gloucester in Massachusetts.

Scenery on the western coast

A sinking of the Scandinavian Peninsula has caused the sea to enter the deep mountain valleys, forming many bays, peninsulas, and islands. It is estimated that there are fully ten thousand islands along the coast of Norway; and there are hundreds of bays and peninsulas.

The long, narrow bays, inclosed in steep mountain walls, are called *fiords* (Fig. 307). Some of these extend fully ninety miles inland. The cliffs are often only barren rock; but here and there, where the slopes are not too steep, green forests cover the surface. Glaciers are frequently in sight, and waterfalls abound on every hand. In some places the swollen streams from the mountains plunge downward for a thousand feet or more, over the nearly vertical cliffs which bound the fiords.

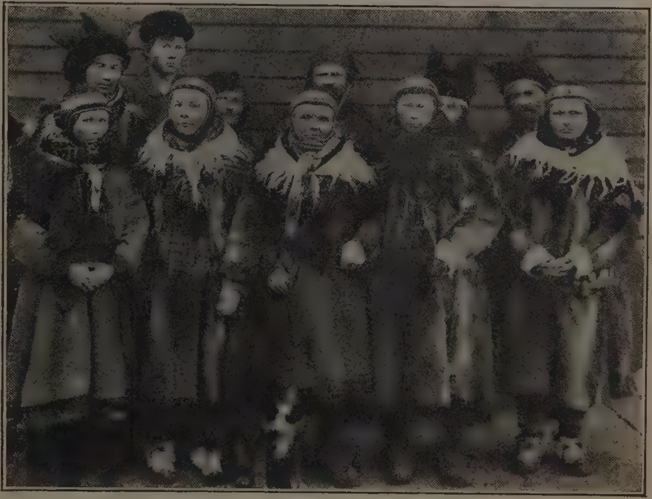


FIG. 306.—Laplanders who live, mainly by fishing, in northern Norway.

Industries of Sweden
1. Agriculture

Agriculture is the leading industry of Sweden. Here, fertile soil, swept from the highlands by the glacier (Fig. 270), has been scattered over the lower lands. This gives to the southern part of the country much the same appearance as New England presents. Oats are raised in greatest abundance, but rye, barley, wheat, and potatoes are also produced. In addition, much live stock is raised, and butter is exported.

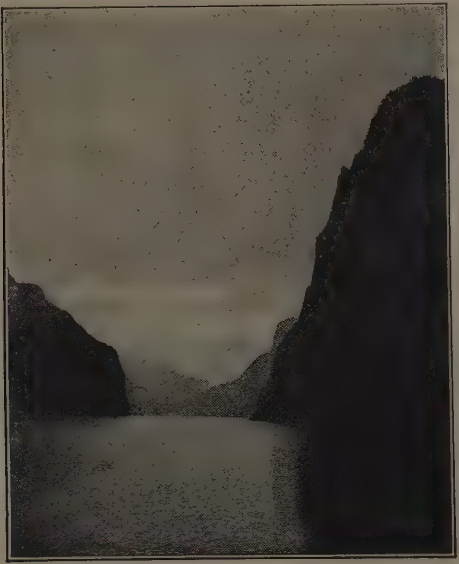


Fig. 307. — A view in one of the grand fiords of Norway.

2. Lumbering

A large part of the land that is too barren and rocky for farming supports a growth of timber. Nearly one half the area of Sweden is covered with forest, and lumber is the principal export, as in Norway. Indeed, these two countries supply much of the lumber used in western Europe.

3. Mining and manufacturing

Mining is the third important industry. There are silver and copper mines; and a small amount of poor coal is found in the south. Sweden has long been noted for its iron ore, but since there is no good coal for smelting it, there is little iron manufacturing. However, some of the iron ore is smelted by the use of charcoal, and some by the use of coal brought from other countries. The Swedish iron is of such excellent quality that much of it is shipped to Sheffield, in England, for use in the manufacture of the highest grade of steel tools.

Sweden possesses excellent water power for various kinds of manufacturing, and some of the numerous rivers are used as a source of power. Manufacturing, by use of water power, is making rapid progress here.

Cities of Sweden

The two principal cities — **Stockholm**, the capital (Fig. 308), and **Gothenburg** — are on the coast; but there are other small seaports and inland mining towns. The situation of Stockholm is one of great beauty. It is on an excellent harbor, and is connected by lake, canal, and rail with the chief points in the country, including Gothenburg. It is the principal distributing center for imports, while Gothenburg is the leading center for exports. The fact that the harbor of Stockholm is blocked with ice for four months each year, while that of Gothenburg is rarely frozen, gives the latter city one advantage as a shipping point.

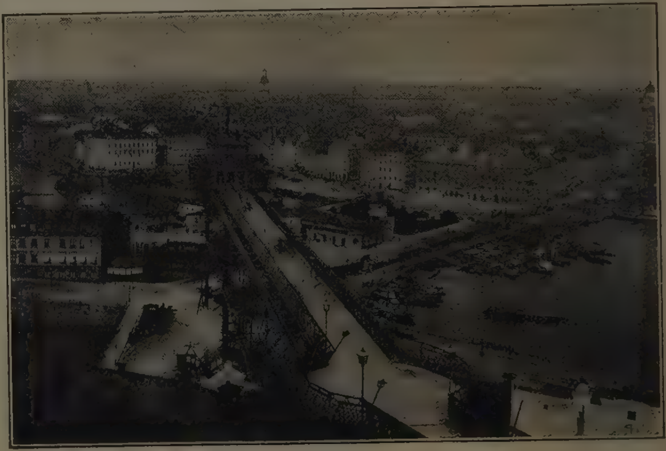


Fig. 308. — A view of Stockholm.

Foreign trade of Norway and Sweden

The principal foreign trade of both Norway and Sweden is with Great Britain. Give reasons for this. What must be the main articles of import and export? Next to Great Britain comes Germany. Can you suggest reasons for this?

Industries of Denmark

1. Agriculture

Farming, especially dairying, is the chief industry of Denmark. In this small country there are over a million and a half dairy cows and about half as many sheep, besides large numbers of horses, goats, and pigs. Butter forms one half the exports of Denmark. The laws of the nation discourage large farms, so that, as in Belgium, by carefully cultivating a small patch of land, each farmer obtains the most that the soil can yield.

2. Fishing, commerce, and mining

The nearness to good fishing has naturally made fishing important; but the fisheries of Scandinavia are of far greater value than those of Denmark. The Danes have much commerce, and some of the men serve as sailors on the ships of other nations, though to a far less extent than the Swedes and Norwegians.

There is neither coal nor metal in the rocks of Denmark, so that there is no mining in the country. The only mineral product of value is clay. As in Ireland, the lack of coal for fuel is partly met by peat from the bogs and swamps.

3. Manufacturing

The position of Denmark, on one of the leading highways of European commerce, has brought its people into close contact with the rest of the world. The Danes are a very highly educated people, and have much manufacturing. In spite of their lack of raw materials, they make machinery, ships, beautiful porcelain, and many other articles.

Foreign trade and leading city of Denmark

As in the case of Norway and Sweden, the principal foreign trade of Denmark is with Great Britain. Therefore one might expect to find an important seaport on the western coast; but that coast is so low, and so shut in by sand bars, that good harbors are lacking. In fact, in all Denmark the only harbor that admits large vessels is COPENHAGEN (meaning merchants' harbor) on Seeland Island. Since this point guards the entrance to the Baltic Sea, there is a double reason why Copenhagen is the principal city of Denmark. The fact that it is the capital also increases its importance.

FIG. 309. — A scene in Copenhagen.

Iceland is an island belonging to Denmark. It is larger than Ireland, and more than twice the size of Denmark. Over a hundred volcanoes are found there, twenty-five of which have been in eruption in recent times. Mount Hekla is one of the most noted of these. Destructive earthquakes are common, and there are also geysers similar to those found in our Yellowstone National Park. The interior is a desert plateau, in part covered by glaciers, and hence not inhabited. Near the sea, however, there is some good pasture land, and the people are mainly engaged in raising sheep and in fishing. Eider down, from the eider duck, is one of the important products of the island. The people are highly educated. What is the capital of Iceland?

Review Questions

1. How has the position of these countries helped to preserve their independence? 2. How have their surface and climate helped toward the same end? 3. Where are the principal agricultural districts? What about their extent? 4. What are the less important industries of Norway? 5. The three leading industries? 6. Name and locate the cities of Norway. 7. Describe the scenery on the western coast. 8. What about agriculture in Sweden? 9. Lumbering? 10. Mining and manufacturing? 11. Name and locate the chief cities of Sweden. 12. What about the foreign trade of Norway and Sweden? 13. What are the agricultural products of Denmark? 14. State the principal facts about the other industries. 15. Tell about the foreign trade and leading city of Denmark. 16. State the principal facts about Iceland.

Suggestions

1. Why should the telephone prove of special importance among the fishing towns scattered along the coast of Norway? 2. By use of a globe explain why the sun does not set for weeks at a time at Hammerfest. 3. Why should Bergen be one of the rainiest cities of Europe? 4. Give reasons why harbors on the Baltic are blocked by ice much oftener than those on the western coast of Norway. 5. Find out about the early Norse explorations of North America. 6. Hans Christian Andersen was a native of Denmark. What fairy stories do you know that were written by him? 7. Read and tell stories of the Norse gods in old-time mythology.

VII. RUSSIA (Fig. 271)

Map study

1. About how much of Europe is included in Russia (Fig. 271)? 2. What part of the distance from pole to equator is included? 3. What does this suggest concerning climate? 4. How much of the boundary of Russia is seacoast? 5. Name the seas which border it. 6. Name the mountains on or near the border. 7. What portion of Russia is occupied by plains (Fig. 272)? 8. In what directions do the large rivers flow? Name the three longest. 9. Is there any outlet from the Caspian Sea? What does that fact suggest? 10. Find Poland, Finland, and Lapland. 11. What parts of Asia are in the Russian Empire (Fig. 351)?

Its size and position

Russia in Europe is as large as all the other European countries together; and the Russian Empire, which includes Siberia and other lands in Asia (p. 329), occupies about one sixth of all the land upon the globe. What countries in North and South America approach European Russia in area? In variety of climate?

In spite of its vast extent, the development of Russia has been greatly hindered by its position, which causes a lack of good harbors. In this respect it contrasts strongly with the United States. To be sure, the sea forms a large portion of the Russian boundary; but ARCHANGEL, the principal port on the White Sea, is icebound for nine months, and the Baltic ports for four or five months, each year, while the entrances to the Baltic and Black seas are guarded by foreign nations. Why are the Caspian ports of no use for foreign commerce?

Surface features

Most of the large rivers of western Europe have their sources in the mountains. Give examples (Fig. 272). It is not so, however, in Russia, where the central divide is a low, hilly region, less than twelve hundred feet above sea level at its highest point. Except for the mountains on and near the border of the country, this is the highest part of Russia.

From what has been said, it is easily seen that most of Russia is a remarkably level plain. Since several of the rivers are very long, what must be true as to the swiftness of their currents? What, then, must follow as to their value for navigation? What about the ease with which canals can be built?

In southeastern Russia, on the other hand, are the lofty Caucasus Mountains (Fig. 269), one of whose peaks, the extinct volcano Mount Elburz, is the highest mountain in Europe. At the very base of these mountains, however, are broad plains bordering the Caspian Sea. In some places these plains are even below sea level.

Climate

1. Temperature

The great distance of Russia from the Atlantic Ocean, over which the west winds blow, has had an important effect on both the temperature and rainfall. For example, Moscow is in the same latitude as Edinburgh; but while at Edinburgh the average temperature for January is 37°, at Moscow it is nearly 25° colder. What effect must this cold have upon navigation of the rivers? Notice which isotherms pass near Moscow and Edinburgh in July. From this you see that, though the winters are colder, the summers are much warmer in Russia than in Scotland, in the same latitude.

2. Rainfall

There is far less rainfall in Russia than in Scotland. In the eastern part of the country there is an average of less than twenty inches a year (Fig. 275). Since this amount is barely enough for agriculture, the crops often suffer, and famines follow in especially dry seasons. Southeastern Russia is in the belt of the horse latitudes, and is so far from the ocean that it is too arid for farming without irrigation.

The Caspian Sea, into which the longest river of Europe pours its floods, is the largest inland sea in the world. In spite of the enormous volume of water which enters this sea, the evaporation in that dry climate has caused it to shrink in size until it is no longer connected with the ocean. The same is true of the Aral Sea (Fig. 352). There is so much evaporation in this region that the surface of the Caspian Sea is eighty-five feet below sea level.

3. Climatic belts

(1) Tundras

Russia may be divided into several belts, according to climate. In the north are the frozen *tundras*, even in summer too cold for agriculture. The scattered Laplanders, who live upon the tundras, have habits resembling those of the Eskimos.

(2) Forests

South of the tundra belt the warmer climate permits the growth of *forests*, including such trees as pine, fir, oak, beech, and birch. Some of this timber has been cut away, and farms have taken the place of forests; but much woodland still remains.

(3) Grassy plains and arid steppes

The forest belt is gradually replaced on the south by open, grass-covered plains similar to those of the central and western parts of the United States. This is the best agricultural region of Russia, and here grains are raised in enormous quantities, especially in the "black earth" section where the soil is fine-grained, black, and very fertile. The climate of the grassy plains gradually becomes more arid toward the south and east, until on the *steppes*, which resemble our Western arid lands, farming without irrigation is impossible.

(4) The Caucasus region

In the extreme southern part of Russia, near the Caucasus Mountains, there is abundant rainfall; and, being so far south, the crops of warm temperate climates are raised, but around the Caspian Sea most of the land is a barren desert.

People

1. Races and languages

The plains of Russia have offered no barrier to invasion. Therefore, many different peoples have come to this region from various directions, and they are now united under Russian rule. Most of these belong to the white race, though to a different division from the German and British peoples. These Russians are *Slavs*, while the inhabitants of Germany, Scandinavia, and the British Isles belong to the *Teutonic* division of the white race. Russia also contains many Jews, Teutons, and other people, including Lapps (Fig. 306) and Finns, both of whom are classed with the Mongolian race. All together, not fewer than forty languages are spoken within the realm.

Government

The emperor, or Czar, is an absolute monarch, "whose will alone is law." In purely local matters, however, the peasants have a voice. Those of each locality meet in a *Mir*, or assembly, to discuss matters of common interest and to elect officers from their number, somewhat as is done in town meetings in the United States.

Many of the Russians have long been dissatisfied with this form of government, and have demanded that the people be given more power. At last the Czar has allowed the people to elect a national body of representatives, called the *Duma*. They are, however, able to do little beyond what the rulers allow, and there is still much complaint.

Fig. 310. — A family of Russian peasants.

Lumbering and fishing

Nearly a third of European Russia is forest-covered; and, as in Norway (p. 277), timber is one of the leading resources. Many fur-bearing animals live in the forest, and Russia, like Canada, exports large numbers of valuable furs.

Fishing is an important industry in Russian waters, and the varieties of fish resemble those of Norway and Sweden. There is a special demand for fish, owing to the number of fast days kept by the Græco-Russian Church, to which the majority of Russians belong.

Agriculture

1. Farming

Both in the forest region and on the open plains to the south, there is extensive agriculture. Fully nine tenths of the people are supported by farming, which shows that Russia is mainly an agricultural country.

The most important crops are the grains, especially rye, wheat, barley, and oats. Russia ranks next to the United States among the grain-producing countries of the world, and wheat is one of its principal exports. Another important crop is hay; and potatoes, sugar beets, and flax are extensively raised in the cool temperate climate. In southern Russia the warm climate permits the culture of grapes, tobacco, and corn; and south of the Caucasus even olives and cotton are grown.

2. Grazing

On the grazing lands of the arid steppes many sheep, cattle, and horses are raised. The nomadic herdsmen still retain many of the customs of the shepherds and herders of Bible times, who dwelt farther south in Asia. This is the home of the *Cossacks*, a people of Tartar descent noted for their skill as horsemen and for their fierce bravery.

Mining

Some parts of Russia contain mineral deposits of great value. In the Ural Mountains, for example, are gold, silver, copper, and platinum, besides some precious stones and graphite, or "black lead," used in lead pencils. Coal and iron are mined in several parts of Russia, and each year the amount is increasing. As in Great Britain, some of the iron ore is so near coal and limestone that it is easily smelted.

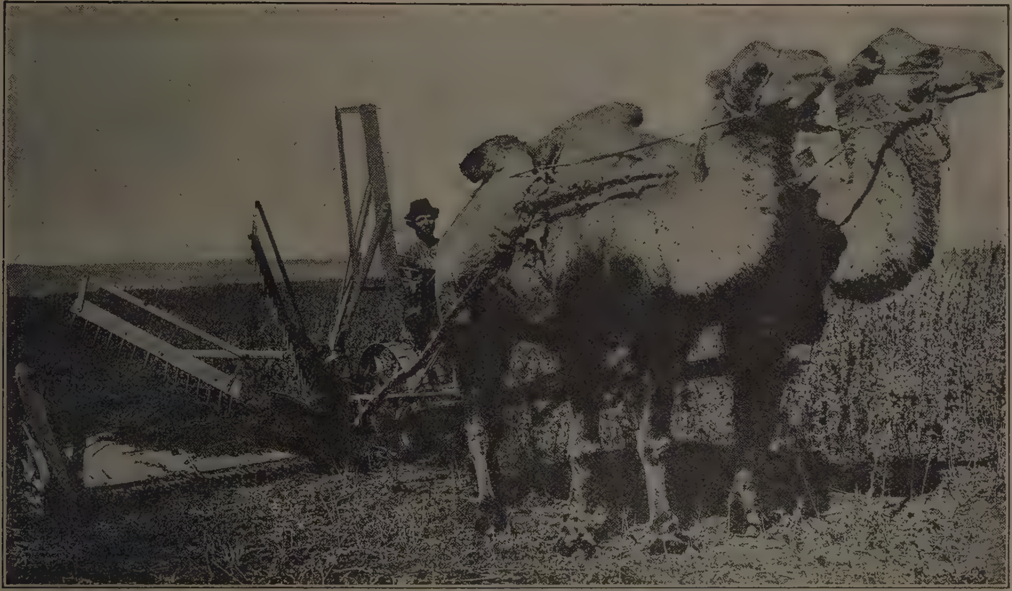


Fig. 311. — Harvesting wheat with camels in southeastern Russia.

Russia ranks next to the United States in the production of petroleum. This oil is found in several places, especially about **Baku** on the Caspian Sea. Large quantities are consumed as fuel for steamers on the Caspian and Volga; and, as in California, the oil is used in locomotives.

Manufacturing

Numerous factories have recently been started in Russia, but most of the manufacturing is still done by hand, in the homes of the workmen. What a contrast to the United States and to Great Britain! Distilling and brewing, cotton manufacturing and sugar refining, are the principal forms of manufacturing carried on in factories; flour mills, woolen and linen factories, and iron works rank next in importance. What raw products of Russia encourage these industries?

For a long time the principal cities of Russia were situated far in the interior. This clearly shows how little Russia was in

Fig. 312. — A Russian peasant girl harvesting wheat by hand.

Principal cities

1. Moscow and Nizhni Novgorod

touch with other countries. For example, Moscow, the second city in size, and once the capital of the empire, is located almost in the center of the realm, as Madrid is in Spain. The point was well chosen, because rivers, which could easily be connected by canals, diverge from this section in all directions. By the introduction of railways the advantage of this central location was so increased that Moscow is now the leading railway center of Russia as Madrid is of Spain, and for the same reason. State this reason (p. 273). Unlike Madrid, the land round about the city is fertile and densely populated. All these advantages have made Moscow one of the chief manufacturing centers of the empire.

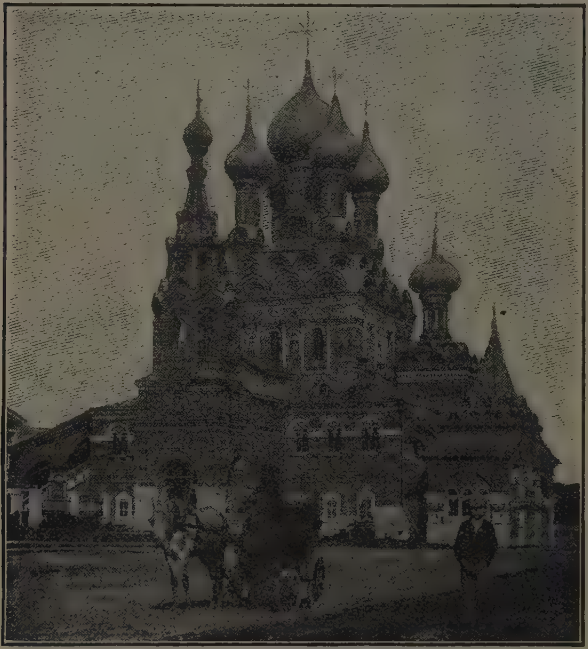


Fig. 313. — A Græco-Russian church in Moscow.

Moscow is adorned with royal palaces, government buildings, and churches (Fig. 313). It is the holy city of Russia, being the center of the Græco-Russian Church. The University of Moscow, the largest in the empire, is attended by about four thousand students.

East of Moscow, on the Volga River, is Nizhni Novgorod, renowned for its yearly fairs. For centuries a great trade center has been needed, somewhere in this vicinity, for the exchange of Asiatic and Russian products. This city has such excellent water connections that it has served as that center. On the map (Fig. 273) point out these connections. The fairs, held in August and September, are the greatest in Europe, and attract as many as two hundred thousand strangers each year. In a single season goods are exchanged to the value of nearly $200,000,000, and prices are fixed on crops and other materials for the coming year.

2. Petrograd and Riga

While the two cities just described are very old, their position in the interior is not favorable for commerce with distant nations. It was this fact that led Peter the Great, in 1703, to found Petrograd at the head of the Gulf of Finland. The site chosen is very marshy, and the climate is cold, foggy, and unhealthful. Moreover, the arm of the sea on which the city is located is so shallow that a ship canal twenty miles in length has been necessary in order to connect it with the deeper water farther west. In addition, the harbor is ice-bound for more than four months each year.

Yet, in spite of all these disadvantages, Petrograd is the largest city in Russia, and the fifth in size in Europe. This growth is partly due to the need of a seaport in this section, and partly to the fact that the city is the capital of a great empire. More goods are shipped from this point than from any other Baltic port. Riga, to the southwest, has about half as much shipping.

Petrograd is a well-planned city, having especially wide streets, splendid public buildings, and fine residences.

3. Odessa

Odessa, another important seaport, was founded a little over a century ago, when Russia gained possession of the northwestern coast of the Black Sea. Besides being the chief outlet for the vast grain trade of southern Russia, and the principal port on the Black Sea, Odessa is an important flour-milling center, like Minneapolis.

4. Warsaw and Lodz, in Poland

Thus far the Russians have not found it possible to obtain possession of Constantinople, although they have, no doubt, felt many a yearning in that direction. Why? They have, however, extended their territory in other directions. For example, they have gained much land in central Europe. At one time there was a powerful kingdom here, called *Poland*, but this was divided among Russia, Austria, and Germany. Russia obtained the largest share, and in this portion are situated Warsaw and Lodz, two of the leading cities in the empire. The former is a center for the railways that connect Russia with western Europe, and the latter is an important manufacturing city. Much coal and iron are mined in this vicinity.

Finland

Finland, whose capital is Helsingfors, although a part of the Russian Empire, has a measure of independence. It has a parliament which makes its laws, but the Czar has the right of veto upon them. Unlike the Russians, most of whom belong to the Græco-Russian Church, the Finns are mainly Protestants, belonging to the Lutheran Church. They are a nation of highly educated people. But it has been the policy of the Russian government to destroy their existence as a nation. On account of mistreatment from the Russians, many Finns and Poles have migrated to the United States.

Review Questions

1. Show how large Russia is. 2. What about its harbors? 3. Describe its surface. 4. What can you say about the temperature? 5. The rainfall? 6. Into what climatic belts can the country be divided? 7. What different races are found among the Russians, and how many languages are spoken by them? 8. What is the condition of the government? 9. Tell about lumbering and fishing. 10. What are the agricultural products? 11. The mineral products? 12. What is the condition of manufacturing? 13. Locate and state the principal facts about Moscow and Nizhni Novgorod. 14. Petrograd and Riga. 15. Odessa. 16. Warsaw and Lodz. 17. Finland.

Fig. 314. — A Russian sleigh in Petrograd.

Suggestions

1. Compare the area of the Caspian Sea with that of Lake Superior. 2. Read about how the inhabitants of Moscow burned their houses in 1812 rather than give shelter to Napoleon's army. What followed? 3. What must be some of the difficulties connected with building good wagon roads in southern Russia? 4. What did Kosciusko, the Pole, do to make his name memorable to Americans? 5. Have you read the story of Thaddeus of Warsaw? If so, what can you tell about it? 6. Read how Peter the Great wandered

through European countries, as a common workman, in order to learn Western customs. 7. Make a sketch map of Russia, with principal rivers and cities. 8. Compare Russia with the United States in area and population (Appendix, pp. 390 and 392); also in degrees of latitude contained.

VIII. German Empire

Map study

1. Compare the latitude of Berlin with that of London (Fig. 271). 2. Of New York. 3. Estimate the greatest length of Germany from east to west (Fig. 315); from north to south. 4. How does it compare in size with the British Isles? With Russia? 5. What parts of the boundary are natural? 6. Point out the principal rivers. In what direction do they flow? 7. Is most of the surface plain or mountainous (Fig. 272)? Where are the mountains? 8. What facts do you notice about the coast line? 9. Is the North Sea, or the Baltic, the more desirable place for seaports? Why?

Position, and its advantages

The position of the German Empire is strikingly different from that of Great Britain. Only about one third of its boundary is water, while it borders upon seven independent countries, besides Luxemburg (p. 264). What are their names?

The location of the British Isles is favorable for world commerce, because densely populated Europe lies near at hand on one side, while the New World lies across the ocean on the other side. Germany also has great advantages in her location. Because it is so central, most of the markets of the continent are at her very doors, while two of her principal ports, HAMBURG and BREMEN, face Great Britain and the west. Name some of the large European cities (Fig. 271) that can be quickly reached from Germany. In these days of railways, Germany's central position is superior to that of England for European trade.

Formation of the empire; present area and population

It has required a long struggle to bring under one rule the various people living within the boundary of the German Empire. For centuries there were many separate states in central Europe with a German-speaking population; and, although they were loosely held together by a confederation, they were often at war with one another. Their condition was, in some respects, similar to our own just after the Revolutionary War. During the War of 1866, Prussia and Austria, the principal kingdoms of the *German Confederation*, fought for leadership. Prussia proved successful, and Austria withdrew from the union. In 1871, under the lead of Prussia, the *German Empire*, with its present boundaries was established.

It contains nearly two hundred and nine thousand square miles, being a little larger than France, and twice the size of Colorado. But it has nearly sixty-five million inhabitants, or about eighty-one times as many as Colorado, and twenty-five million more than France.

Government

All together there are twenty-six states within this empire, some of them being *kingdoms*, some *duchies*, and some merely *free towns*. The smallest is the Free Town of BREMEN, which includes only ninety-nine square miles, and two hundred and ninety-eight thousand inhabitants. The largest is Prussia, whose area is more than half that of the entire empire, and whose population is about five eighths that of all Germany.

These states are united under a central authority, more closely than our states. In place of a President they have an Emperor, the *King* of Prussia, being by law the *Emperor* of Germany; and their form of government is a limited monarchy. The power of the German Emperor is, however, much greater than that of the British King, though far less absolute than that of the Russian Czar.

In a war with France, in 1870, the Germans defeated the French, and seized some French territory west of the Rhine, called

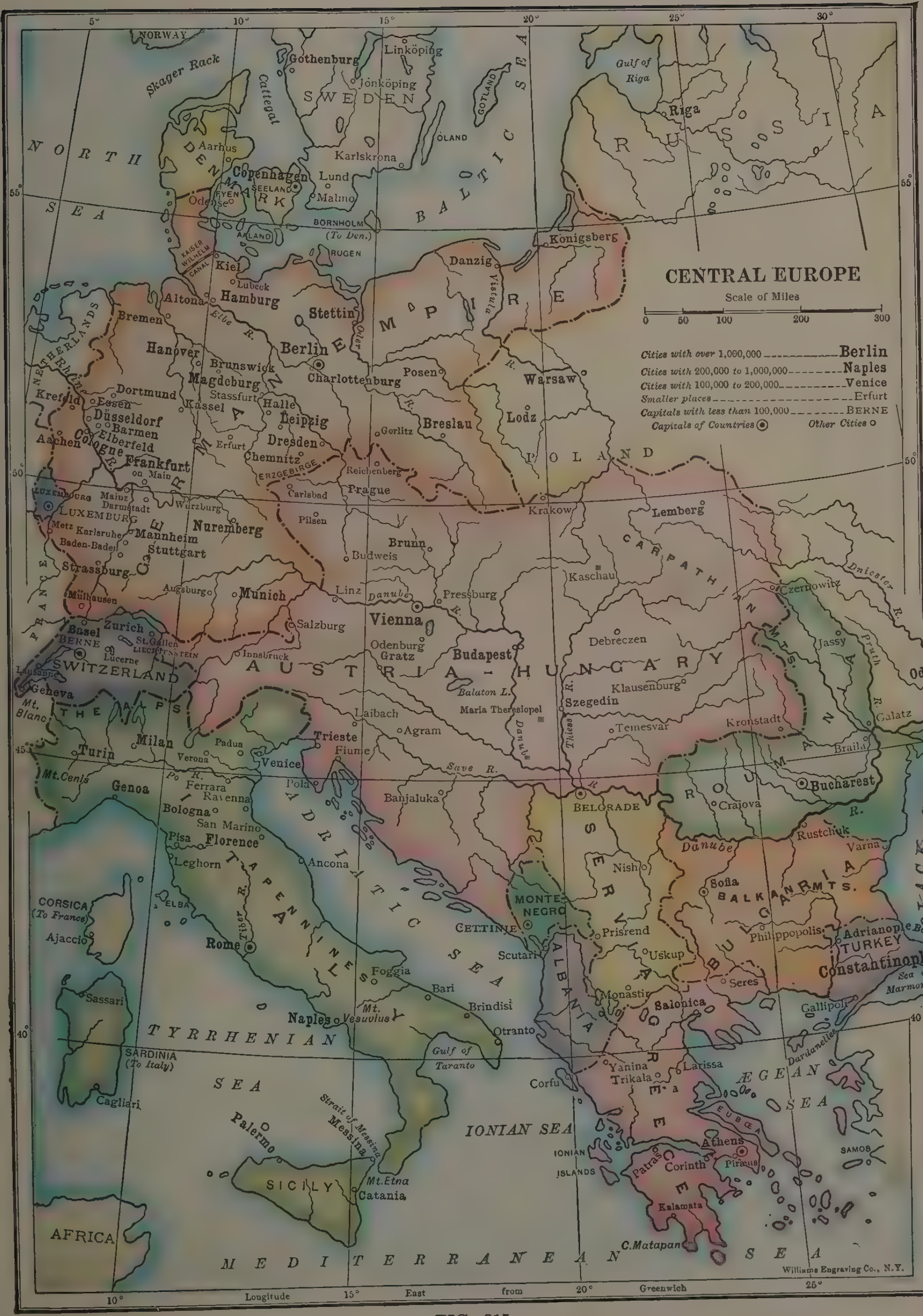

CENTRAL EUROPE
Scale of Miles
0
50
100
200
300
Cities with over 1,000,000 Berlin
Cities with 200,000 to 1,000,000 Naples
Cities with 100,000 to 200,000 Venice
Smaller places Erfurt
Capitals with less than 100,000 BERNE
Capitals of Countries
Other Cities
NORWAY
Skager Rack
Cattegat
NORTH SEA
DENMARK
Aarhus
Copenhagen
SEELAND
FYEN
Odense
ALSEN
KAISER WILHELM CANAL
Gothenburg
Linköping
Jönköping
SWEDEN
GOTLAND
ÖLAND
Karlskrona
Lund
Malmo
BORNHOLM
(To Den.)
BALTIC SEA
RUGEN
Gulf of Riga
Riga
RUSSIA
Konigsberg
Danzig
Vistula
Kiel
Lubeck
Altona
Hamburg
Bremen
Stettin
Oder
GERMAN EMPIRE
NETHERLANDS
Rhine
Elbe R.
Hanover
Brunswick
Berlin
Charlottenburg
Posen
Warsaw
Magdeburg
Stassfurt
Krefeld
Essen
Dortmund
Düsseldorf
Barmen
Elberfeld
Cologne
Aachen
Kassel
Halle
Leipzig
Erfurt
Dresden
Chemnitz
Gorlitz
Breslau
Lodz
POLAND
Frankfurt on Main
ERZGEBIRGE
Reichenberg
Carlsbad
Prague
Krakow
LUXEMBURG
Mainz
Darmstadt
Wurzburg
Metz
Karlsruhe
Mannheim
Nuremberg
Baden-Baden
Stuttgart
Pilsen
Brunn
Budweis
Lemberg
Kaschau
CARPATHIAN MTS.
Strassburg
FRANCE
Mülhausen
Augsburg
Munich
Linz
Danube
Pressburg
Czernowitz
Dniester R.
Salzburg
Vienna
Basel
Zurich
St. Gallen
LIECHTENSTEIN
BERNE
Lucerne
Innsbruck
Odenburg
Gratz
Budapest
Debreczen
Jassy
Pruth R.
Odessa
Lausanne
SWITZERLAND
Geneva
AUSTRIA-HUNGARY
Klausenburg
Mt. Blanc
THE ALPS
Balaton L.
Maria Theresiopel
Szegedin
Thiess R.
Laibach
Agram
Temesvar
Kronstadt
Galatz
Turin
Milan
Padua
Trieste
Fiume
Braila
Verona
Venice
Mt. Cenis
Po R.
Ferrara
Pola
Save R.
Genoa
Ravenna
Banjaluka
BELGRADE
ROUMANIA
Bucharest
Craiova
Bologna
San Marino
Pisa
Florence
Leghorn
ADRIATIC SEA
Ancona
APENNINES
SERVIA
Nish
Danube
Rustchuk
Varna
BLACK SEA
Sofia
BALKAN MTS.
BULGARIA
CORSICA
(To France)
ELBA
Tiber R.
MONTENEGRO
CETTINJE
Prisrend
Philippopolis
Adrianople
Bosporus
TURKEY
Constantinople
Ajaccio
Rome
Scutari
Uskup
Seres
Sea of Marmora
ALBANIA
Monastir
Salonica
Gallipoli
Sassari
Foggia
Bari
Naples
Mt. Vesuvius
Brindisi
Otranto
TYRRHENIAN SEA
SARDINIA
(To Italy)
Gulf of Taranto
Dardanelles
Yanina
Trikala
Larissa
ÆGEAN SEA
Corfu
Cagliari
Strait of Messina
Messina
Palermo
IONIAN SEA
IONIAN ISLANDS
EUBŒA
Athens
Piræus
Corinth
Patras
SAMOS
GREECE
SICILY
Mt. Etna
Catania
Kalamata
AFRICA
C. Matapan
MEDITERRANEAN SEA
Williams Engraving Co., N.Y.
Longitude East from Greenwich
5°
10°
15°
20°
25°
30°
55°
50°
45°
40°

FIG. 315.

Why the boundary is so irregular

Alsace-Lorraine, in which Metz and Strassburg are situated. Much of Germany's irregular frontier has been determined in a similar way. Mountains form the southern boundary, to a great extent, and water the northern; but the eastern and western limits, largely decided by war, do not follow any natural barrier. Draw an outline map of Germany, to show this boundary line.

Strong forts are built near the boundary, as at Cologne, Metz, and Strassburg on the French side, and Königsberg and Posen near Russia. Forts are also numerous in the neighborhood of the great interior cities, and at other important points. The cost of these strongholds, with the vast sums of money required to keep up the army and navy, makes a heavy drain upon the nation.

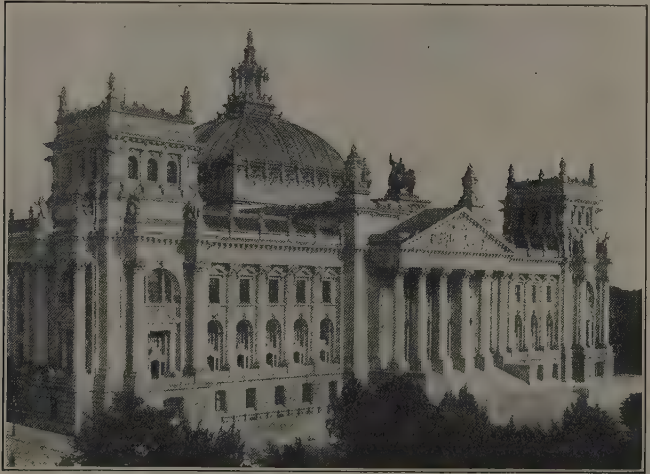


Fig. 316. — The building in Berlin where the German Parliament meets.

Germany is not unlike other leading European nations in these respects. As already stated (p. 258), the British, having no close neighbors, rely mainly upon their powerful navy for defense. Every one of the Great Powers demands the service of many men, and expends large sums of money either for the army, or navy, or both.

Surface features

1. The highlands

Germany includes two quite different kinds of land. The southern section is mainly a region of ancient mountains, worn down to low relief like the mountains of Great Britain and New England. It is, in fact, a somewhat irregular plateau, from one to two thousand feet in height, with some ranges rising high enough to be called mountains (Fig. 317). Only in the extreme south, on the edge of the Alps, is a great altitude reached. Here one peak rises nearly ten thousand feet above sea level.

2. The lowlands

Northern Germany, on the other hand, is a lowland whose elevation is rarely more than six hundred feet. This lowland, mainly in Prussia, broadens toward the east until it merges into the plains of Russia. In the neighborhood of Holland this plain is very low and flat (Fig. 318); but in most places its surface is rolling, owing partly to the irregular deposits left by the Great Glacier.

3. Drainage

Most of the drainage of Germany is northward into the North and Baltic seas. Name and trace the courses of four large rivers which flow northward. What river has some of its headwaters in the highland region of southern Germany, then crosses Austria, and finally enters the Black Sea?

Climate

1. Temperature

Note the number of degrees of latitude included in Germany. One might expect a warmer climate in the south than in the north; but on account of its elevation, the southern plateau is about as cold in winter as the northern lowland. In summer, on the other hand, the southern part, being nearer the interior of the continent, is warmer than the northern. There are some low, partly inclosed

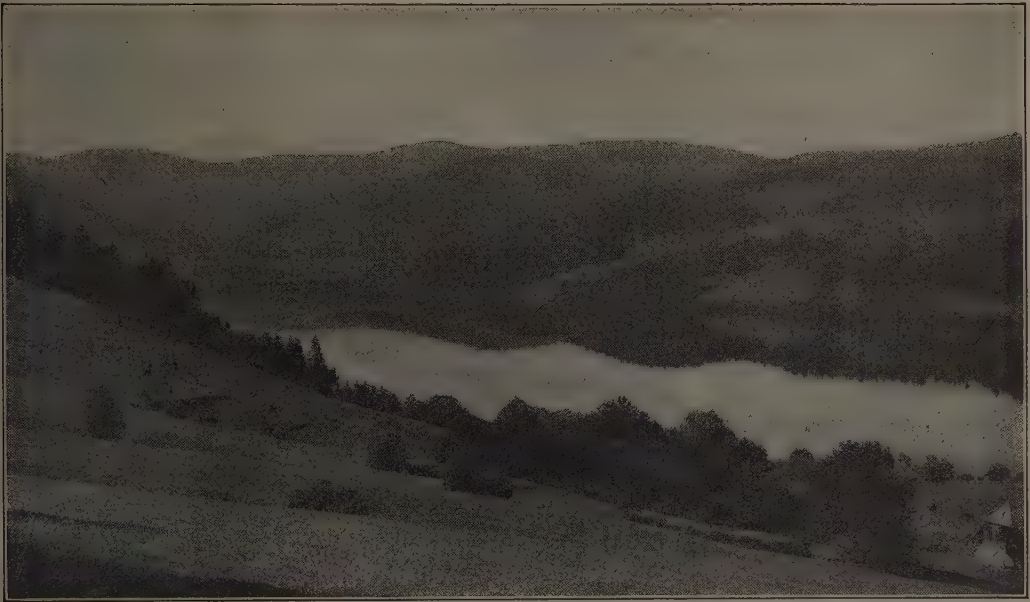


FIG. 317. — A view in the Black Forest, one of the low mountain regions of southern Germany.

valleys in the south, however, where the climate in winter as well as in summer is warmer than that of the northern plains.

2. Rainfall

There is ample rainfall for agriculture in all parts of the empire. It is true that there is less rain than in eastern United States; but in the cooler summer climate of Germany not so much is needed by plants, because there is less evaporation. In the United States, east of the Mississippi, there is an average annual rainfall of about forty inches; but in Germany there are only twenty-eight inches in the west, and twenty inches in the east, near the Russian border.

Lumbering

1. Location and extent of the forests

There are several low mountain areas in Germany where the soil is too poor for farming, but where the slopes are not too steep, or cold, for forest growth. Indeed, the German word for woods (*wald*) is a part of some of the mountain names, as in Schwartzwald, which means Black Forest (Fig. 317). Forests also cover some of the lowlands where the soil is poor. All together about one fourth of the surface of the empire is covered with trees.

The good sense of the German people is

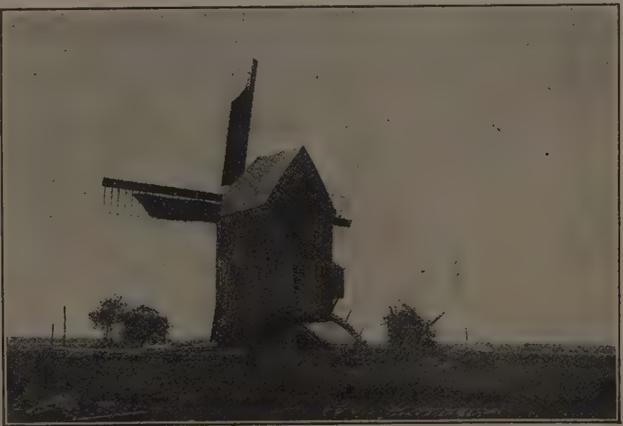


FIG. 318. — A view on the low level plain of north Germany.

2. Care of the forests

well shown by the way they treat their woodlands. Instead of wastefully destroying them by fire and the ax, — as has been done in so many parts of our country, — the Germans have developed an excellent system of forest culture. Trees are planted in place of those that are cut for timber, and they are given proper care, so that the woods continue to be abundant. In this way the forest is made to yield a profit every year, just as a farm does. Germany produces a large part of the lumber she uses, and also exports a great deal.

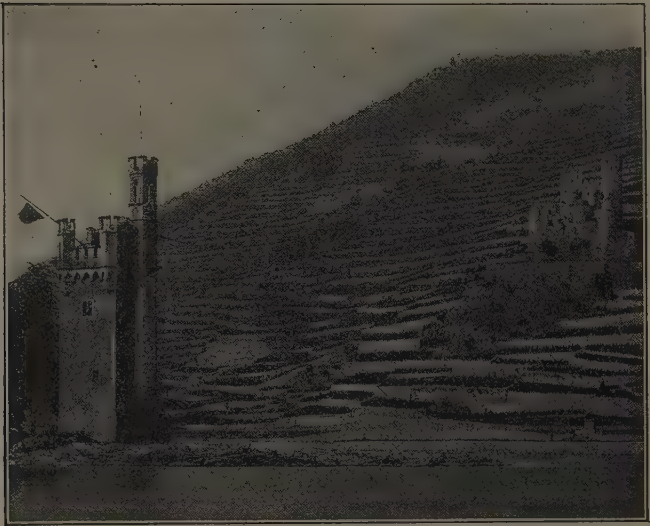


Fig. 319. — Vineyards on the steep slope of the Rhine Valley near Bingen. The land is terraced here and the small patches of vineyard are inclosed within walls of rock.

It is partly the example of the Germans that has led our own country, at last, to begin to pay attention to the care of our forests. Our government has set aside many large forest reservations (p. 116), and schools of forestry have been started at the universities, where young men are trained for the profession of Forestry.

Agriculture
1. Its importance

On the whole, Germany has not a fertile soil; but the farm products are very extensive, because the people are both industrious and intelligent, and their method of cultivating the soil is excellent. What countries may well be contrasted with Germany in this respect? More than one third of the German people depend for their living upon agriculture, the leading industry of the nation.

2. Farm crops

Germany is one of the most important grain-producing countries of Europe; but here rye takes the place of wheat as the principal grain. Potatoes, introduced from America, are raised in such quantities that, like rye, they form one of the principal foods. These two crops are extensively cultivated, both because they are cheap foods, and because they flourish in a light soil and a cool summer climate. Sugar beets, hay, oats, and barley are other important crops of the northern plains, while in the valley of the Rhine, and in other warm, sheltered valleys of the south, hops, tobacco, and grapes are raised in large quantities (Fig. 319).

3. Live stock

Since much of the lowland is too sandy for cultivation, and much of the highland too rugged, it is not surprising that one sixth of all the surface is natural pasture. Cattle for beef and for dairy purposes are kept in nearly all parts of the empire, but especially in the damper climate of the west. Largely because wool can be imported so cheaply, the raising of sheep in Germany is becoming of less importance. Swine raising, on the other hand, is increasing because of the cheap feed supplied by the refuse from the beet-sugar factories.

Although Germany raises a great quantity of food, her population, like that of England, is so dense that she cannot produce all that she needs. Much wheat and meat must therefore be imported.

Mining

Next to the United Kingdom, Germany is the greatest mining country of Europe; and, as in Great Britain, her most valuable minerals, coal and iron, often occur in the same region. Germany reminds us of our own country in the wide distribution of her coal beds. The coal fields that were found in northeastern France and Belgium (Fig. 275) extend into Germany in the neighborhood of AACHEN; and from this point eastward to the Russian border there are several important coal fields.

Manufacturing

1. Its importance

From the above facts we may expect to find Germany an important manufacturing country, with her manufacturing centers well distributed. Explain why. About a third of the people are engaged in manufacturing, and in recent years Germany has advanced very rapidly in this industry. Among the European countries she now ranks next to the United Kingdom in the quantity and excellence of her goods.

2. Leading centers of manufacturing

The position of the coal and iron mines accounts for the location of the principal centers for iron manufacturing. The busiest section is along the Rhine, in the vicinity of COLOGNE; and this region may well be compared with northern England in the extent of its industries. A second center is round about DRESDEN and CHEMNITZ; and a third is at BRESLAU in the southeastern corner of the empire.

The map (Fig. 315) shows no cities south of BRESLAU; yet this is a busy manufacturing region. Cities are lacking here because the people carry on the manufacturing mainly in their own homes, instead of in factories. Therefore, although villages stretch for miles along the valleys, there are no large towns.

3. Leading kinds of manufacturing

(1) Textile and iron goods

As in several other countries so far studied, the textile industries are best developed near the coal fields. Therefore the sections mentioned above are noted for cotton, woolen, and silk factories, as well as for iron. All the cotton and silk, and much of the wool, for these textile industries has to come from abroad. But the people south of Breslau make use largely of raw materials raised near by, spinning and weaving flax and wool and making lace.

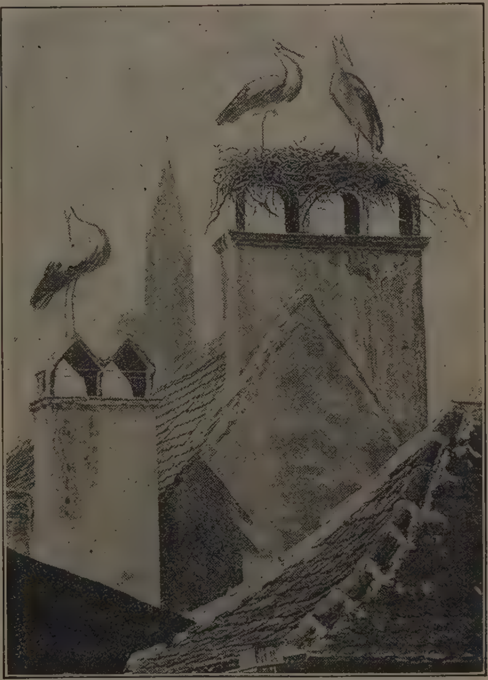


FIG. 320.—Storks in Strassburg, where they build their nests on the chimney tops.

(2) Lumber and lumber products

The extensive forests partly account for a third occupation in many sections; namely, the manufacture of furniture, paper, and other materials made of wood. Wood carving is an important industry in the Black Forest and other parts of Germany.

(3) *Beet sugar*

Germany is also a great sugar-manufacturing nation. Until a few years ago nearly all sugar was obtained from sugar cane; but this was changed when German chemists found a means of obtaining sugar from beets. By improving the process, and by developing the beets until they contained more sugar, the industries of sugar-beet raising, and the refining of beet-root sugar, have been made possible. This industry has now spread to many countries, including the United States.

Each year this kind of sugar has been proving a greater rival to sugar cane, until now a large part of the sugar used in Europe, and much of that consumed in North America, is obtained from sugar beets. One important reason why this industry has thrived is that sugar beets grow in a cool temperate climate, where population is dense and markets are numerous. How is the case different with sugar cane? Formerly Germany had to rely upon foreigners for sugar; but with the growth of this industry, beet sugar has not only supplied all the needs at home, but has even become one of the leading German exports.

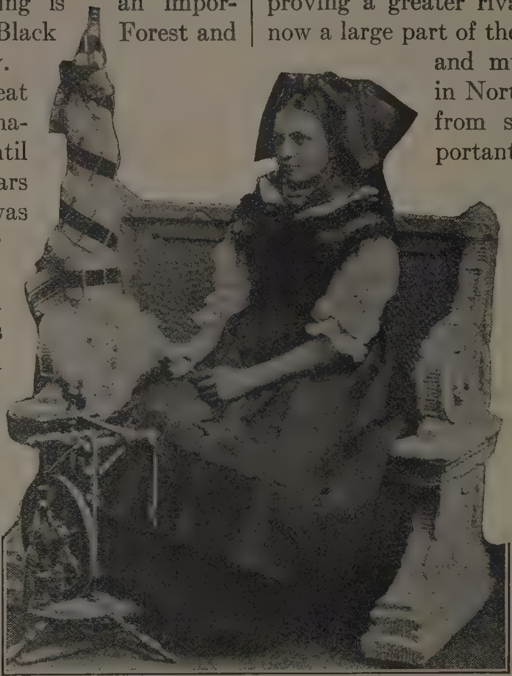


Fig. 321. — A German peasant girl spinning wool.

Germany's rapid advance

1. Nature of the advance

In the last half century no other European country has grown so rapidly as Germany. There has been a large increase in population, a great advance in industry, and a corresponding gain in wealth.

Fig. 322. — A village in the Hartz Mountains, where the people carve articles of wood in their homes.

2. Reasons for it

(1) ***The government***

One cause for this advance is the strong central government established in 1871. This caused the people to forget the petty jealousies that had long checked the growth of industries, and led them to unite to develop the resources of the empire.

The government's treatment of education has also been of great importance. Every Ger-

(2) Education

man child is forced by law to attend school; and careful attention is given to the study of the industries, foreign products, foreign languages, etc. In the higher commercial and technical schools young men are given excellent training for business, while in many other countries there is little or no opportunity for such education.

The value of scientific work is fully recognized and encouraged by the government; and the wonderful development of the sugar industry, the mines, and the factories since 1871 proves that this has been a wise policy. Not many years ago much of the manufacturing was done by hand; but now factories are found on every side, and Germany is one of the three leading manufacturing nations of the world. Name the other two.

(3) Improvement in transportation

Great advance has been made in transportation. The rivers and harbors have been made more useful; canals have been extended over much of the country; and German steamship lines have been established to various parts of the world. There is now an excellent system of railways, reaching to all parts of the empire, and connecting Germany with other European countries. The piercing of the Alps by tunnels, thus improving the connection with the Mediterranean, has also been of advantage.

(4) Establishment of colonies; and interest of German emigrants

The establishment of colonies has been a fourth important aid to Germany's growth. The empire now controls extensive areas in the island of New Guinea, north of Australia, and in both East and West Africa, as well as smaller colonies elsewhere (Fig. 327). These have had influence on Germany, both because they have furnished homes for emigrants from crowded parts of the home country, and because they have brought much trade to Germany.

Many more Germans have emigrated to various parts of the New World. Over five million have come to the United States within the last seventy-five years, while the British Isles have sent us about seven million. Many of the German emigrants to these other countries have kept up trade with their *fatherland*, and have thereby increased the commerce of Germany.

Principal cities

1. Their rapid growth

Naturally, in a country making such rapid advances, the cities have grown also, as has been the case in the United States. In the twenty years between 1870 and 1890, for example, Berlin had a more rapid growth than New York, and added as many new residents as Chicago. In 1875 Boston had almost a hundred thousand more people than Hamburg; but now Hamburg has over two hundred and sixty-one thousand more than Boston. These and other German cities are still rapidly increasing in size.

2. Berlin

(1) Its location

The position of Berlin, on the small Spree River on the North German plain, midway between the coast and the highlands, may not at first seem a very favorable one. However, the Oder, a large river, and some of the tributaries of the Elbe approach so near each other in this section that they have easily been connected by canal. Thus, Berlin has water connection with both Hamburg and Stettin, two important seaports, and with all parts of these two river systems. This is a very important aid in bringing fuel, food, and raw materials for manufacture, and in taking away manufactured articles.

Berlin lies on the direct route from Hamburg to Breslau, and from Stettin to Leipzig, and other large cities surround it. It is, moreover, on the route of several of the chief European railways, and is therefore one of the leading railway centers of the continent.

(2) Its importance

With such excellent connections, by water and by rail, Berlin has become one of the principal manufacturing cities of the empire. Fully half the residents are supported by manufacturing, which includes brewing, the making of fancy articles, clothing, machinery, etc. Besides being the capital of Prussia and of the German Empire, Berlin is the center of German banking. It is noted for its art and music, and for its great university, the largest in the empire. There are a number of suburbs, one being Potsdam, the German "Versailles," in which are located several royal palaces.

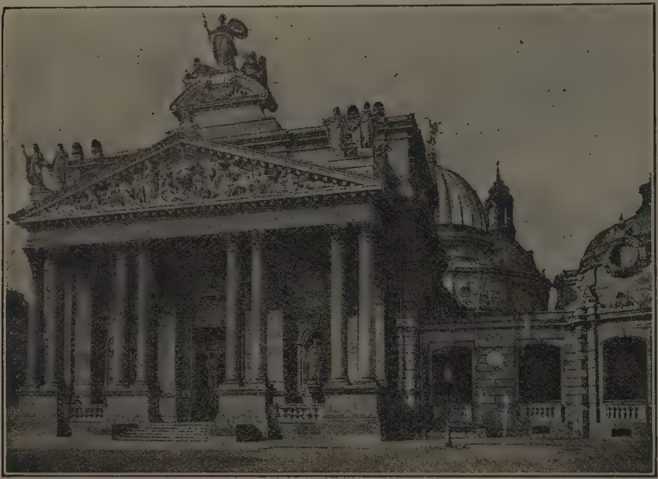


Fig. 323. — The Dresden Art Museum, which contains many treasures of art.

3. Interior cities near Berlin

(1) Leipzig

Among the cities not far from Berlin is Leipzig, the fifth in size in the empire. It is situated at the junction of two small streams, at a point where roads from the highland meet those from the lowland. Formerly it was at the crossing of important wagon roads, and now it has become a railway center. Owing to its favorable position, Leipzig is, next to Berlin, the most important trade center of Germany. One of its leading articles of commerce is fur. It is the seat of a noted university, and a center for the German book trade.

(2) Dresden

Dresden, southeast of Leipzig, is noted for its art museum (Fig. 323), which rivals the Louvre of Paris. The beautiful Dresden china is made in this vicinity, and in recent years much manufacturing has developed; for Dresden is situated on the navigable Elbe and has coal near at hand. It is, moreover, the capital of Saxony, the most densely settled German state.

(3) Chemnitz, Halle, and Magdeburg

Chemnitz, near by, has important textile industries. Halle and Magdeburg, farther to the northwest, and in the center of the chief beet-growing section, are extensively engaged in the manufacture of sugar.

(4) Breslau

Breslau, a city not much smaller than Leipzig, is on the Oder, a navigable river. It has the advantage of being near a very rich coal and iron field, and is, therefore, a great manufacturing center. Its situation, near the Russian frontier, makes it an important market for eastern and central Europe.

4. Munich and Nuremberg

In the highland of South Germany is Munich, the capital of the kingdom of Bavaria. Although so far to the south, and so distant from coal, Munich is the third city in size in the realm. It is on the trade routes from Germany to Italy and to Austria, and is accordingly an important railway center. Much of its renown is due to its art collections and its art industries, such as work in bronze, gold, silver, glass painting, and porcelain manufacturing.

North of Munich, on the road to Berlin, is Nuremberg. This quaint city was famous in former centuries for its art and architecture, and many of its treasures are still carefully preserved. At present it is an important center for the manufacture of toys.

Hamburg, which is growing so rapidly in population, is the second city in Germany

5. Seaports

and the most important seaport on the continent. The reasons for this are clear when it is known that the estuary of the Elbe makes an excellent harbor, usually free from ice, and that Germany has an extensive foreign trade. Name some articles from the United States that probably enter this port. What water connections has Hamburg with the interior?

BREMEN and STETTIN also admit large vessels, and are the chief rivals of Hamburg; but they together have less than one half as much commerce as Hamburg. In what respects is the situation of Hamburg more favorable to commerce than that of Bremen and Stettin? Name other Baltic ports besides Stettin. Which is a natural outlet for wheat from Russian Poland? Estimate the distance saved to the Baltic ports by the cutting of the Kaiser Wilhelm Canal, south of Denmark, which is sixty-one miles in length. What city is at the eastern end of this canal?

6. Cities along the Rhine River

(1) *Cologne and vicinity*

On ascending the Rhine into Germany we come to the great manufacturing region, already mentioned (p. 291). What cities are found there? COLOGNE, the largest, with a population of over half a million, is on the river bank. It is a great shipping point, since railways cross the river, and boats from London and other places are able to ascend to this point.

(2) *Frankfurt.*

Just beyond the chief bend in the Rhine is FRANKFURT, on a navigable tributary, the Main. The easiest route from the Rhine Valley to the Danube lies along this tributary; and, since the railway from the German plain to the upper Rhine passes Frankfurt, this city is a center of important trade routes. For this reason it is one of the chief trading and banking centers in Germany. It has long been prominent, and was the capital of the old German Confederation (p. 286).

The Rhine River compared with the Hudson

1. In scenery

The Rhine, the most important river in Germany, is often compared with the Hudson. In both rivers there are sections that are shut in by high, rocky cliffs, well wooded to the top. The Rhine, however, is much narrower than the Hudson, so that these walls seem loftier; and since the stream is more winding, they often stand out boldly, as if in the very path of boats, to bar their further progress.

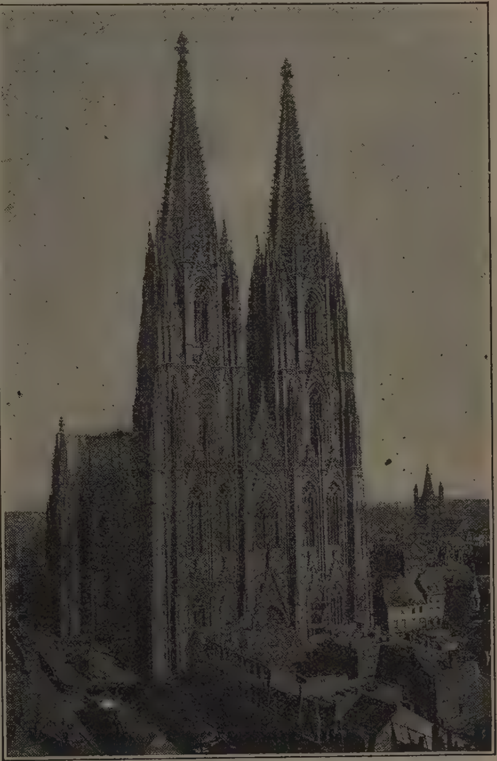


FIG. 324. — The Cologne Cathedral, one of the most famous churches in Europe.

2. In distribution of population along its course

In regard to the distribution of cities along its banks, the Rhine offers still further contrast to the Hudson. The latter has a large population at only two points; namely, near its mouth, where there are millions of people, and about one hundred and

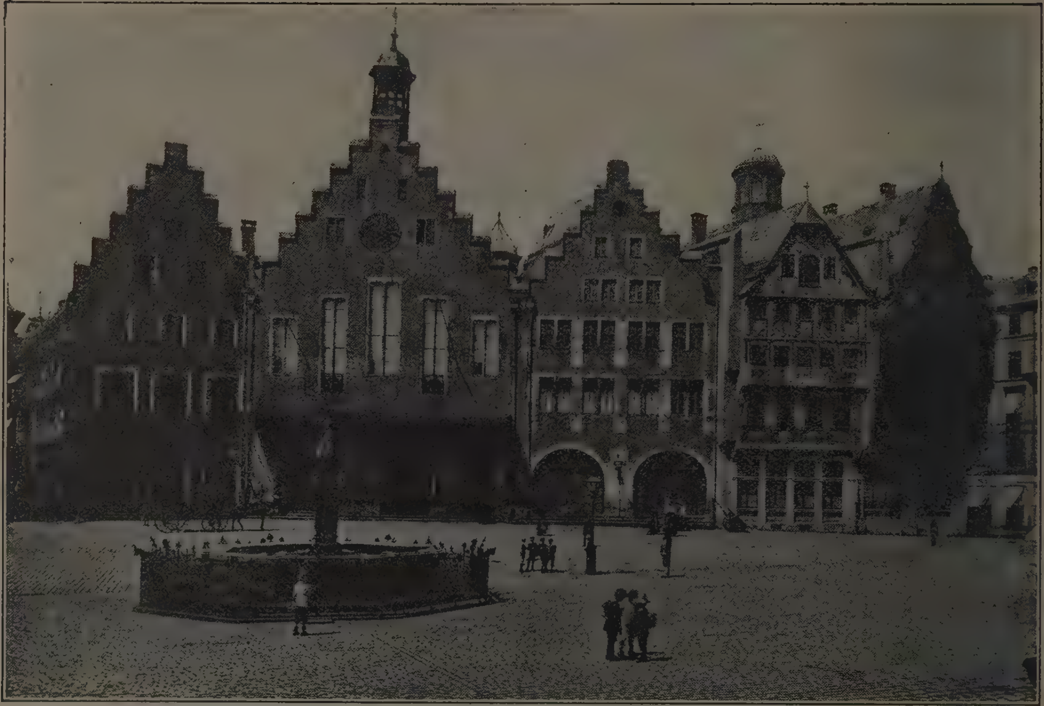


FIG. 325.—Some of the quaint houses in the ancient city of Frankfurt.

fifty miles above the mouth, where Albany, Troy, and Cohoes are situated. Between Yonkers, just above New York City, and Albany, there is not a city with thirty thousand inhabitants. The Rhine, on the other hand, while having no enormous collection of people at any one point, has many populous cities along its course. Name several. What have you already learned about Rotterdam at its mouth? How does it compare with New York City in size?

FIG. 326.—The Rhine, with a village, a vineyard, and an old castle on the right.

Review Questions

1. What is the position of Germany? Explain its advantages. 2. What about the formation of the empire; its present area and population? 3. State the chief facts about the government. 4. Why is the boundary line so irregular? 5. Describe the highlands. 6. The lowlands. 7. The drainage. 8. Tell

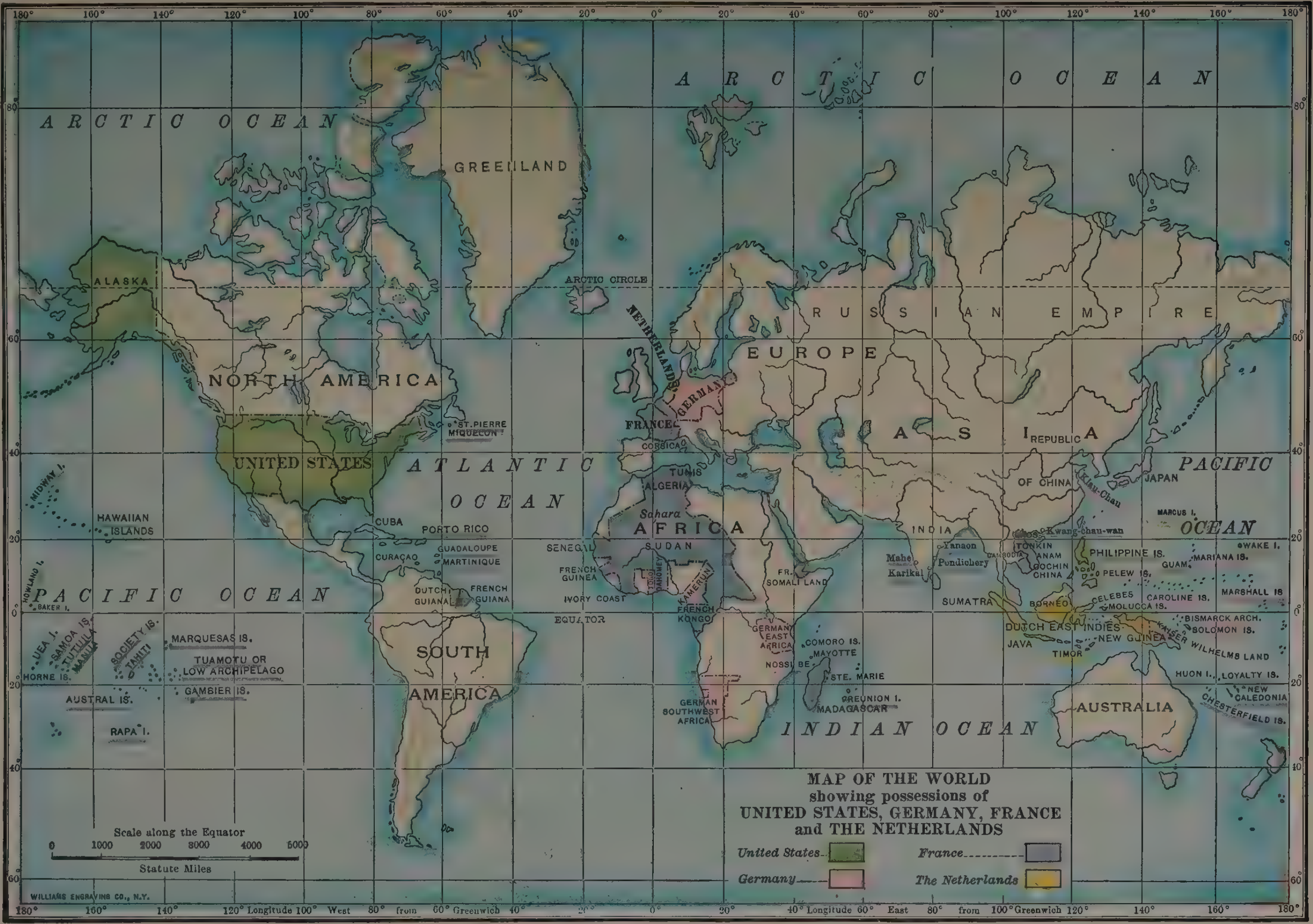

MAP OF THE WORLD
showing possessions of
UNITED STATES, GERMANY, FRANCE
and THE NETHERLANDS
United States
Germany
France
The Netherlands
Scale along the Equator
0 1000 2000 3000 4000 5000
Statute Miles
WILLIAMS ENGRAVING CO., N.Y.
Longitude West from Greenwich
Longitude East from Greenwich
ARCTIC OCEAN
GREENLAND
ARCTIC CIRCLE
ALASKA
NORTH AMERICA
UNITED STATES
ST. PIERRE
MIQUELON
ATLANTIC OCEAN
CUBA
PORTO RICO
GUADALOUPE
MARTINIQUE
CURAÇAO
DUTCH GUIANA
FRENCH GUIANA
SOUTH AMERICA
HAWAIIAN ISLANDS
MIDWAY I.
HOWLAND I.
BAKER I.
PACIFIC OCEAN
UEA I.
SAMOA IS.
TUTUILA
MANUA
HORNE IS.
SOCIETY IS.
TAHITI
MARQUESAS IS.
TUAMOTU OR LOW ARCHIPELAGO
GAMBIER IS.
AUSTRAL IS.
RAPA I.
NETHERLANDS
GERMANY
FRANCE
CORSICA
EUROPE
RUSSIAN EMPIRE
TUNIS
ALGERIA
Sahara
AFRICA
SUDAN
SENEGAL
FRENCH GUINEA
IVORY COAST
TOGO
DAHOMEY
KAMERUN
FRENCH KONGO
EQUATOR
FR. SOMALI LAND
GERMAN EAST AFRICA
COMORO IS.
MAYOTTE
NOSSI BE
STE. MARIE
REUNION I.
MADAGASCAR
GERMAN SOUTHWEST AFRICA
INDIAN OCEAN
ASIA
REPUBLIC OF CHINA
INDIA
Mahe
Karikal
Yanaon
Pondichery
Kiau-Chau
Kwang-chau-wan
TONKIN
CAMBODIA
ANAM
COCHIN CHINA
SUMATRA
BORNEO
JAVA
DUTCH EAST INDIES
CELEBES
MOLUCCA IS.
TIMOR
NEW GUINEA
KAISER WILHELMS LAND
PHILIPPINE IS.
PELEW IS.
CAROLINE IS.
GUAM
MARIANA IS.
MARCUS I.
WAKE I.
MARSHALL IS.
BISMARCK ARCH.
SOLOMON IS.
HUON I.
LOYALTY IS.
NEW CALEDONIA
CHESTERFIELD IS.
JAPAN
PACIFIC OCEAN
AUSTRALIA

FIG. 327.

what you can about the temperature; the rainfall. 9. What is the condition of lumbering? 10. What are the leading agricultural products? 11. What are the principal mineral products? 12. State the importance of manufacturing; and locate the leading manufacturing centers. 13. Name the principal kinds of manufacturing. 14. How has Germany advanced in recent years? Give some reasons for it. 15. What can you tell about the rapid growth of the cities? 16. State the principal facts about Berlin. 17. Leipzig. 18. Dresden. 19. Chemnitz, Halle, and Magdeburg. 20. Breslau. 21. Munich and Nuremberg. 22. The seaports. 23. The cities along the Rhine. 24. Name and locate the principal cities of Germany. 25. Compare the Rhine River with the Hudson in scenery. 26. In distribution of population along its course.

Suggestions

1. Find in an atlas in what parts of the empire the larger states, such as Prussia, Bavaria, Saxony, etc., are situated. 2. What seaports of Europe most nearly approach Hamburg in size? 3. How might the Kaiser Wilhelm Canal possibly prove an injury to Hamburg? 4. Show that Germany resembles Great Britain in her industries, while differing greatly from Russia and Norway.

IX. SWITZERLAND (Fig. 315)

Map study

1. What countries surround Switzerland (Fig. 315)? 2. What mountains extend along the boundaries of Switzerland? 3. Which of the boundaries is least mountainous? 4. What large rivers rise among the Alps? In what direction does each flow? 5. There are many lakes among the Alps (Fig. 332). What does their abundance suggest? 6. How does the area of Switzerland compare with that of your own state?

Surface features

This is a very mountainous country (Figs. 328 and 332), for the Jura Mountains are on the northwestern border, while the Alps occupy the southern half. Between these two mountain systems, which extend northeast and southwest, is a low, hilly plateau, from one to two thousand feet in altitude. About one third of Switzerland is included in the plateau belt.

Climate

1. Temperature

It is evident that the climate of this mountainous country must be cool, and that there must be great differences in temperature according to the altitude. At the base of the Alps, chestnut and walnut trees grow; higher up, these give place to the beech, maple, and other trees of the cool temperate zones; and still higher is a belt of evergreens. Above these come dwarfed trees, shrubs, and grass; and higher still, at an average elevation of about nine thousand feet, the snow line is reached.

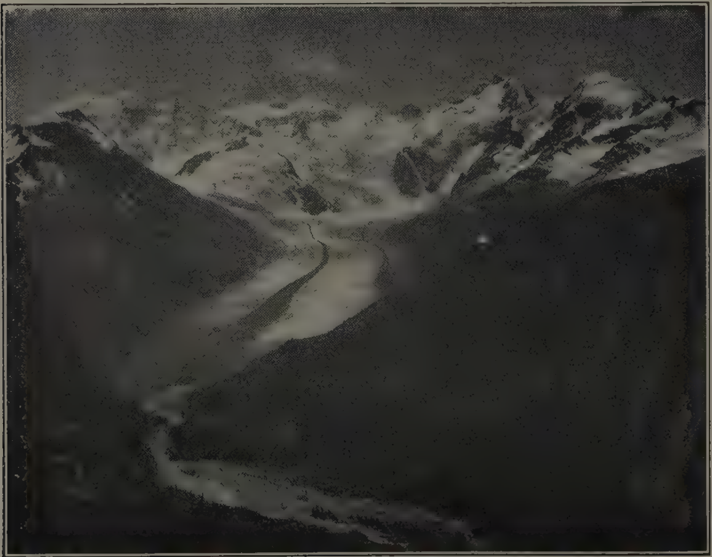


FIG. 328. — Snow-covered mountains with a glacier extending from them down one of the Alpine valleys.

2. Rainfall and the formation of glaciers

The lofty Alps, rising in the path of the prevailing west winds, cause Switzerland to be one of the wettest countries on the continent. On the higher mountains much snow falls; and, sliding down the mountain sides in the form of avalanches, it gathers in the valleys to produce streams of ice, or *glaciers* (Fig. 328). These move slowly down the valleys until they reach a point, below the snow line, where the ice melts. The Rhone and other rivers are supplied with water by the melting of the Alpine glaciers.

People and government

In so rugged a country one would hardly expect a large population; yet Switzerland is almost as densely settled as France, and much more so than the state of New York.

People who dwell among mountains develop a spirit of independence, as is illustrated by the story of William Tell. Thus we find that, as early as 1291, an agreement was made among a few of the small Swiss states, or *cantons,* to unite for protection. Many a time since then other nations have tried to conquer the Swiss; but, aided by the difficult approaches to their country, and by the mountain strongholds to which they could retreat, the Swiss have been able to maintain their freedom. Yet the area of the entire country is only one third that of Pennsylvania. Their twenty-two cantons, united somewhat as are our states, now form a republic whose independence the Great Powers of Europe have agreed to maintain.

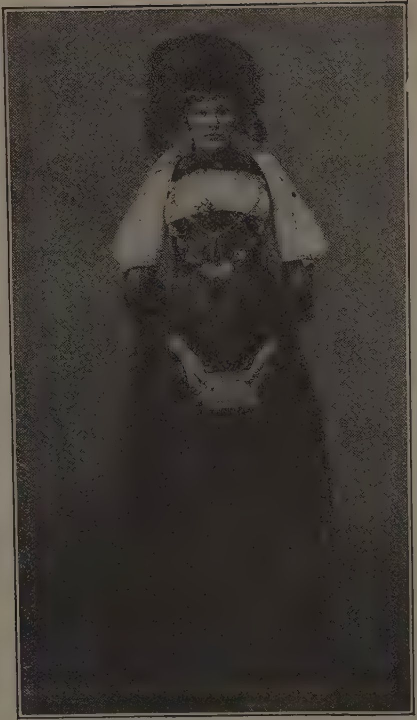


Fig. 329. — A Swiss peasant girl in native costume.

Languages

Although the Swiss have a stable government, they lack a common language. The country is most open toward the north, for there the plateau of Switzerland merges into that of Germany. Naturally, therefore, the influence of Germany has spread into Switzerland, and German-speaking people are most numerous, making up over one half of the population. The approach from France is much more difficult, and the French population forms less than one fourth of the whole, while the remainder speak Italian.

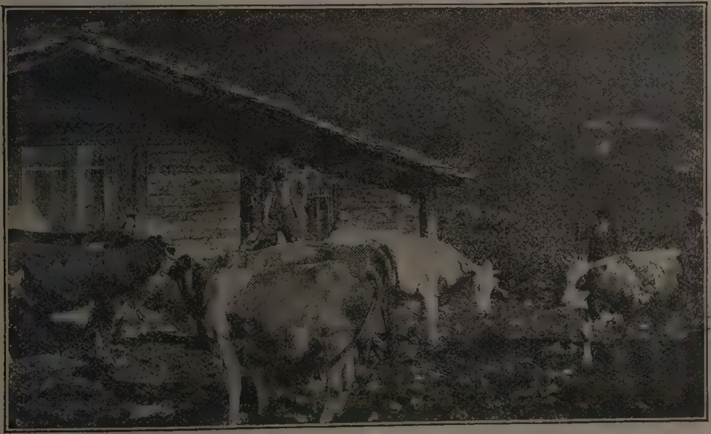


Fig. 330. — Cattle on the slopes of the Alps.

Agriculture

Owing to the mountainous condition, only one acre in nine is fit for the plow. Yet agriculture is the principal industry.

On the lower lands grain, potatoes, grapes, and the mulberry tree are raised, as in the neighboring countries; and on the lower mountain slopes dairy farming is important, as might be expected. Here cattle and goats are raised, being driven to higher pastures as the snows melt from the mountain sides. The population is so dense, however, that much food must be imported; but cheese and condensed milk, made from farm products, are exported.

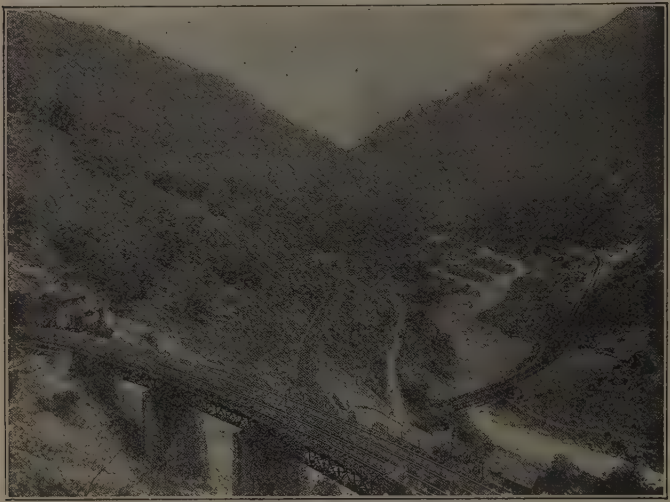


Fig. 331. — The St. Gothard Railway on the south side of the Alps. Here are seen three tracks one above the other, for at this point the railway enters the mountain, swings in two great circles, coming out each time at a higher level.

Mining and manufacturing

Switzerland is very poor in mineral deposits, and there is very little coal. Such a scarcity of raw materials would suggest that there is little manufacturing; but this is not the case, for in spite of the absence of coal, ore deposits, and cotton, the Swiss have developed extensive manufacturing. Like the New Englanders, they make light articles mainly, such as jewelry and textile goods, especially silk. They also do much wood carving.

Reasons for so much manufacturing

1. Water power

There are several reasons why manufacturing is so highly developed. Although coal is wanting, there is abundant water power, supplied by the swift mountain streams, which are fed by the melting snows. The Swiss are taking a leading place in the use of such power, by means of electricity.

2. Skill

They are unusually skillful mechanics, too, a fact that is proved by the remarkable wood carving for which they have long been noted.

3. Central location

The Swiss are further favored by their central position; for they are surrounded by densely populated countries which supply raw materials and furnish a market for manufactured goods.

4. Roads and railways

Finally, their roads and railways are remarkably developed. One might think that it would be very difficult to transport goods in such a country. In fact it would be, if the Swiss had not taken special pains to overcome the difficulties; but the very fact that nature has made transportation so difficult, has led the people to build the best of highways. No country in the world has better roads than Switzerland.

Railroads pierce the mountains in several directions, connecting Switzerland with foreign countries.

Leading cities

ZURICH, the largest city in Switzerland, is situated on Lake Zurich. It is an important railway center, being connected with Italy by the St. Gothard Railway, and other railways bring it in touch with France, Germany, and Austria. These railroads are especially important in bringing foods, as well as silk and other raw materials, for manufacture.

Therefore Zurich is the center of one of the principal manufacturing districts. It is noted for the manufacture of silks, cotton, and machinery.

BASEL, the second largest city in Switzerland, is the busiest railway center in the country. It is on the main line of the St. Gothard Railway, and on the Rhine at the point where it enters Germany from Switzerland. Why is its position, near both France and Germany, favorable to manufacturing?

GENEVA, situated on the lower end of Lake Geneva, near where the Rhone enters France, is the third city of the Republic, and a noted educational center. It is on a very ancient and important trade route from the Mediterranean to Germany (p. 271), and has excellent railway connections. There is much manufacturing, among the important articles made being jewelry and scientific instruments.

BERNE, the capital, is centrally located; but it is a small city because it is not favorably situated for commerce.

Scenery and tourists Many of the Swiss cities and towns are beautifully situated upon lakes, and within sight of mountain peaks always covered with snow. LUCERNE, for example, is surrounded by grand and varied scenery. The city is located upon Lake Lucerne, and lofty mountains rise close at hand (Fig. 332). Mounts Rigi and Pilatus are near by, and from their summits one obtains magnificent views of the lake, over four thousand feet below, bordered by green meadows and numerous villages. In several directions, as far as the eye can reach, are the snow-covered crests of stupendous, jagged mountains.

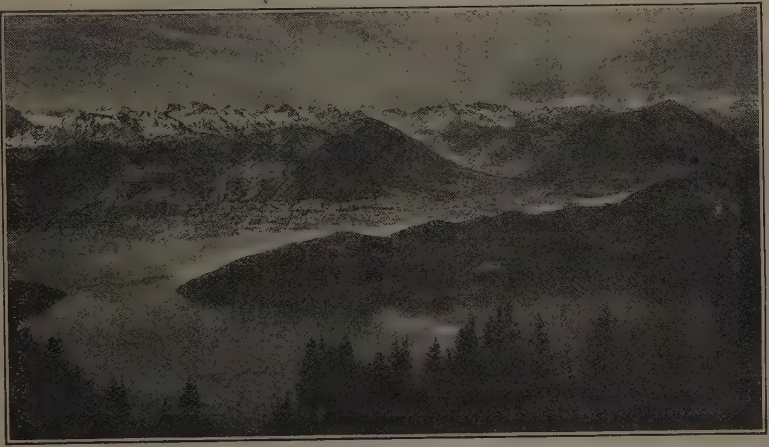


FIG. 332.—The snow-capped Alps as seen from Mount Pilatus, with Lake Lucerne in the foreground.

On account of such scenery Switzerland is the most noted summer resort of Europe; and the entertainment of visitors is one of the leading occupations of the Swiss people. There are so many hotels and fine roads, that one can easily go almost anywhere. It is possible even to reach the tops of several of the mountains by rail. Every summer many Americans cross the ocean to enjoy the Swiss scenery.

Review Questions 1. Describe the surface of Switzerland. 2. The climate. 3. State the chief facts about the people and the government. 4. What can you say about the languages? 5. State the principal facts about agriculture. 6. About mining and manufacturing. 7. Give several reasons why manufacturing is so well developed. 8. Locate and state the main facts about Zurich. 9. Basel. 10. Geneva and Berne. 11. Why is Switzerland so attractive to tourists?

Suggestions 1. How may the lakes filter and regulate the rivers? 2. What reasons are there for giving particular attention to the study of English and other foreign languages in the Swiss schools? 3. Why has Switzerland, unlike many European countries, not come into possession of colonies? 4. Switzerland has long been selected as a place of refuge for persecuted people and political refugees from other nations. Why? 5. Read the story of William Tell.

X. ITALY (Fig. 315)

Map study 1. The shape of Italy reminds you of what object (Fig. 315)? 2. How does its latitude compare with that of Spain? 3. What neighboring islands belong to it? 4. Point out the principal river. 5. How are the lofty mountains in the north likely to affect the climate farther south? 6. What countries border Italy? 7. What seas border it? 8. How does its position seem to be favorable for commerce?

Its area and population The area of Italy, including the islands of Sicily and Sardinia, is only a little greater than that of Colorado; but its population is over thirty-four million. It is the smallest of the six Great Powers, but is the most densely settled of any except the United Kingdom. Name the other Great Powers.

Importance of its position The position of Italy is a very favorable one. It lies in the midst of the Mediterranean, whose shores are densely populated. What country in Africa lies nearest to Italy (Fig. 271)? Estimate the distance to it. How far is it from Italy to the Suez Canal (Fig. 271)?

It has been said that Italy is "the very heart of the Mediterranean lands, and plays a great part as a link in the chain of communication between northwestern Europe and the Far East." For example, mails from London to India are carried by water to the western coast of continental Europe, and then go overland to Brindisi, and thence by steamer. From this it is plain that Italy's central position is an advantage for trade with Africa and Asia, as well as with southern Europe.

People and government The inhabitants of Italy are a mixture of many peoples. In early times, the central position of the peninsula was of importance in aiding Rome to control the lands bordering on the Mediterranean Sea. At that time people from the surrounding lands of Europe, Asia, and Africa were brought to the peninsula, often as slaves captured in war. Later, when the power of the Roman Empire was weakened, hordes of barbarians invaded Italy from central Europe.

For centuries after this, Italy was broken up into a number of independent states. In 1860, however, several of these states united to form the Kingdom of Italy. Later others were added, until in 1870, or about the time that the German Empire was formed (p. 286), the present kingdom was established, with ROME as its capital. Like most of the European countries, Italy is governed by a limited, or constitutional, monarchy.

Surface features Throughout most of its extent, the Italian peninsula is mountainous. In the north are the Alps, some of whose highest peaks are on the boundary between Italy and Switzerland. The Alpine ranges curve around in northwestern Italy and join the Apennines, which extend the entire length of the peninsula and form its very backbone. The principal lowlands, therefore, are the narrow coastal plains and the broad Po Valley. There are also many small, fertile valleys among the mountains.

Climate

1. Temperature We think of Italy as a sunny land of flowers, although Milan and Venice are in nearly the same latitude as Montreal. One reason for the pleasant Italian climate is that the lofty Alps form a wall which cuts off the cold north winds. Another reason is that the temperature is greatly influenced by the Mediterranean Sea, whose waters do not freeze even in winter. On these accounts the Italian winters are mild; and in the extreme south the temperature seldom falls to the freezing point.

2. Rainfall Much of Italy has an abundance of rain; but everywhere, except in the north, the greater part comes in winter. The summer drought is due to the fact that the horse-latitude belt moves northward in summer and covers Italy (p. 196); therefore at that season the climate of southern Italy resembles that of southern Spain.

Agriculture

Such a climate, together with a fertile soil, helps to explain why agriculture is the principal industry of Italy.

1. Extent of irrigation, with reasons

The most extensive farming district is the fertile plain of the Po Valley. There is an abundance of rain here; yet the people depend upon irrigation more than in most other parts of Europe. There are several reasons for this. In the first place, the tributaries of the Po, fed by the rains, snows, and glaciers of the mountains, furnish a steady supply of water to the gently sloping land. Besides this, the rivers frequently flow through lakes — some of them among the most beautiful in the world (Fig. 333) — which act as great reservoirs for water supply. This tends further to furnish a regular supply.

FIG. 333. — Lago di Garda, one of the Italian lakes on the southern side of the Alps. Here are found groves of lemon trees along the shores of the lake.

In the second place, better crops can be raised by irrigation than without it, partly because the flooding of the land fertilizes the soil, and partly because with irrigation there can be no drought. By the aid of irrigation, from four to ten crops may be raised in a year.

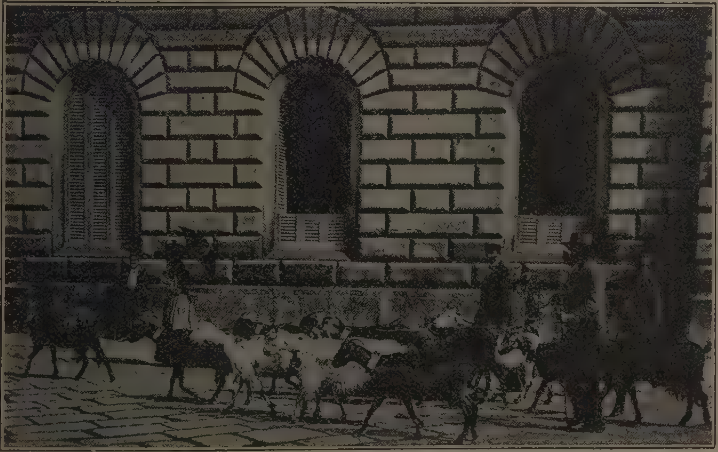


FIG. 334. — A herd of goats in the streets of Naples. They are driven from door to door, and milked whenever the customers wish to buy the milk.

2. Agricultural products

Among the products are many that thrive in semi-tropical climates, as well as others that are common in northern Europe. Where irrigation is so easy, the extensive cultivation of rice is possible. This is an important crop in northern Italy; but corn and wheat are raised in still greater quantities. Grapes are grown to such an extent that Italy ranks first among the wine-producing countries of the world; and so many silkworms are reared that raw silk is the most valuable export. Among the other important products are eggs, which are exported in large quantities; also olives, oranges, lemons, flax, hemp, and wool.

On some of the slopes forests are grown, but most of the natural forest was cut off long ago. Among the useful trees is the chestnut, which is planted in groves for the nuts, that serve as an important food. The Italian chestnut is much larger than ours, and is ground up into a kind of meal, as wheat is ground into flour.

Among the mountains there is much natural pasture, to which herds of sheep and goats are driven in summer. Many goats are raised in Italy for their milk, and they are even driven into the cities, and milked at the doors of the customers (Fig. 304).

3. Important drawback to agriculture

One great drawback to the proper development of agriculture in Italy is the presence of broad, marshy tracts infested with mosquitoes, whose bite causes malaria. This is especially true in the southern half of the country, and there, even with fertile soil and a warm climate, large tracts of land have had to be abandoned. One sixth of the population suffers from malaria, and there are thousands of deaths from that disease every year. It is not to be wondered at that the Italian government is attempting to stamp out this dread disease.

Fishing and mining

The fishing industry is important. Among the peculiar products of the sea are precious coral and sponges. You will remember that we found sponge fishing important also among the Bahama Islands east of Florida.

In Italy there is a general lack of valuable mineral deposits. Except in the island of Elba there is almost no iron; and no coal of value is found in the kingdom. Indeed coal, wheat, and cotton are the leading imports. There is a little zinc and copper ore; but one of the most important mineral products is the sulphur of Sicily. Another mineral product is the pure white Carrara marble, of such rare beauty that it is prized the world over.

Manufacturing

As in Switzerland, water power supplies the place of coal to some extent, often being used to produce electricity. There is, therefore, more manufacturing than one might infer from the lack of fuel. While much raw silk is produced, and there is some silk manufacturing, a large part of the raw silk is sent to France, Switzerland, and elsewhere, to be made into cloth. There are also factories for woolen, cotton, and flax weaving, and for other purposes.

Most European countries take pride in their fine art museums; but Italy far surpasses them all. It is the very storehouse of art, whether architecture, painting, or sculpture be considered. Because of the artistic tastes of the Italians, many of their manufactured articles are of an artistic nature. Among their manufactures are glass work, lace making, earthenware manufacture, the making of statuary, wood carving, coral carving, and straw plaiting. In what other country have we found that the artistic taste of the people greatly affects their manufactures (p. 268)?

Principal cities in the south

1. Naples and vicinity

(1) Beauty of its location

Estimate the average width of the Italian peninsula. Since it has many excellent harbors, we may expect to find numerous large cities along the coast, as in Great Britain. But it is different in the interior, for in so small and mountainous a country, with no coal and iron, there is less reason to expect large cities there.

The most populous city is NAPLES, in the southern part of the peninsula. The semicircular Bay of Naples, on which it is situated, presents a most magnificent sight. On the north side, near the head of the

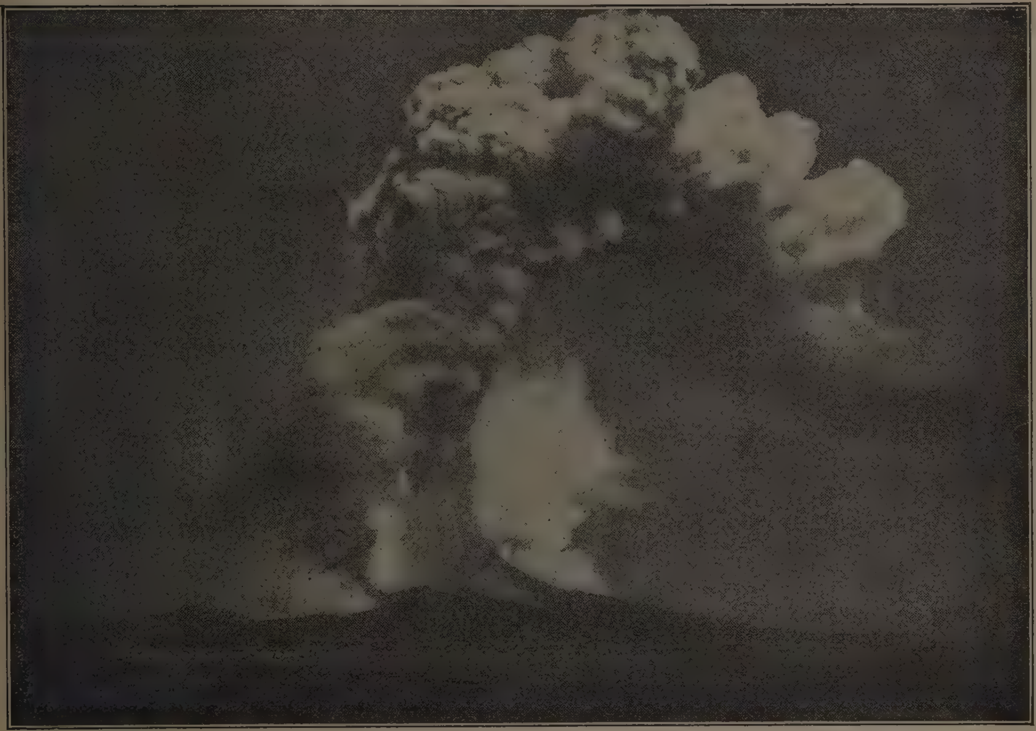


FIG. 335. — Vesuvius in eruption (1892). A great column of steam and ash rises above the volcano; while streams of liquid rock, or lava, are flowing down its slopes.

bay, is the city itself, rising, street above street, upon the slopes of some low hills. Toward the east is Mount Vesuvius (Fig. 325), with the crests of the Apennines in the distance. And on the south side of the bay is a steep, rocky coast, behind which are numerous villages, partly hidden among groves of orange, lemon, and olive trees. All around the bay is a succession of towns and villages.

(2) Reasons for the dense population here

This is one of the most densely settled regions in Europe. There are several reasons for this. One is the fact that the land here is especially fertile, having been made so by the decay of the volcanic ashes that have been thrown out of Vesuvius. The climate is also favorable to the growth of crops, and therefore the region around the bay supports a dense agricultural population. The harbor, too, is good, so that there is more shipping here than in any other Italian port, with the single exception of Genoa.

(3) Mount Vesuvius; its history and attractions

Within plain sight of Naples stands Mount Vesuvius, a cone of lava and ashes nearly a mile in height, from whose crater volumes of steam constantly pour forth. At the time of Christ the slopes of this mountain were dotted with productive farms, and thriving towns spread over the country at its base. But in the year 79 a terrible eruption took place which completely buried Pompeii, Herculaneum, and many villages, beneath showers of ashes and streams of volcanic mud. Since then Vesuvius has been in eruption many times, the last violent outbreak occurring in 1906.

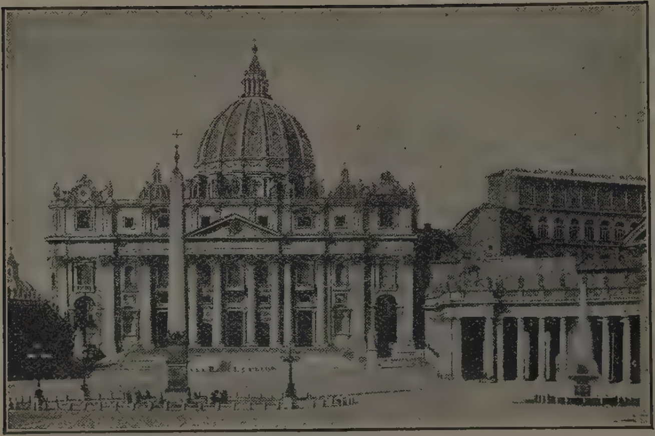


Fig. 336. — St. Peter's Cathedral (on the left) and the Vatican (on the right) in Rome.

2. Palermo

The principal city south of Naples is Palermo, the capital of Sicily. It is situated in the midst of extensive vineyards and fruit groves. What fruits should you expect to find there?

Rome

1. Advantages of its location

The site of Rome was well chosen. It lies near the center of the Mediterranean and near the center of the Italian Peninsula as well. In that part of Italy the fertile coastal plains are broad, and are crossed by the Tiber, the largest river of the country except the Po. In that vicinity, also, the Apennines reached their greatest height, which insures abundant water supply for the Tiber and for irrigation on the plains. Moreover, the valley of the Tiber offers one of the most convenient routes across the peninsula. These are some of the advantages that attracted to ancient Rome a population of fully a million, and caused the surrounding country to be thickly settled and carefully tilled.

2. Influence of malaria

Now, however, the city contains about half as many inhabitants, while the neighboring plains, for miles around, though beautiful pasture land, have scarcely a tree or a house upon them. Because of the dread malaria, people shun this region, and at present much of the country is used only for grazing. As summer approaches, even the herdsmen flee with their cattle and sheep to the mountains.

3. Its attractions

Although agriculture and commerce do not flourish near Rome, fine residences, public buildings, art galleries, and notable ruins are numerous in the city. The dome of *St. Peter's* — the largest and most famous church in the world — towers above everything else; and the *Vatican*, where the Pope resides, is the most noted palace in Christendom (Fig. 336). In the Vatican are some of the finest and most beautiful of Michael Angelo's paintings.

The ruins of ancient Rome, which rival in interest these works of later days, cover so many acres that the city is almost as much a tomb as a living city. One of the most notable relics of the past is the *Colosseum* (Fig. 337), a huge, oval-shaped amphitheater, open to the sky, with seats for forty

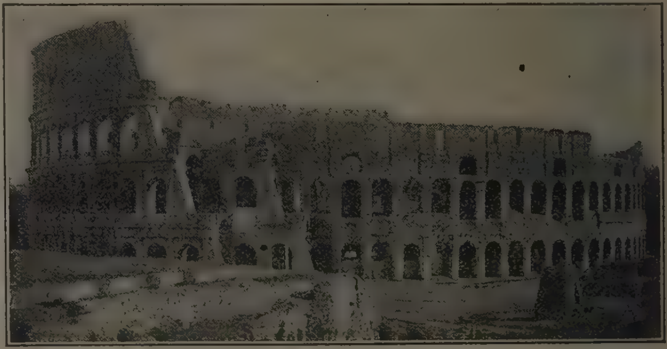


Fig. 337. — The Colosseum, one of the ruins of ancient Rome.

or fifty thousand persons. In the days of the Roman Empire it was used to witness life-and-death struggles between men, and between men and wild beasts.

The *Forum* is another extensive ruin within the city limits. It was the great public square, on a lowland among some low hills; but its monuments, arches, and other ornaments became covered with rubbish during the centuries that followed the fall of the Roman Empire. The excavation of this famous spot has not yet been completed, whole buildings, as well as smaller objects, having been buried in that locality.

Principal cities in the north

1. Florence

With the exception of Rome and Naples the large cities of the Italian Peninsula are in the northern part. The first one north of Rome is FLORENCE, on the western base of the Apennines, at a junction of roads across the mountains. Straw plaiting, mosaic work, and silk manufacturing are important Florentine industries. Florence is famous for its art galleries, which are among the best in the world.

2. Milan and Turin

MILAN, the leading city of northern Italy, owes its importance to its location at the crossing of routes of travel and commerce; one of these runs east and west in the Po Valley, the other north and south across the Alps. TURIN has flourished for a similar reason. From very early times these cities have been important trade centers because of their position at the crossing of trade routes in a fertile, densely populated valley. The railways recently built across the Alps (p. 300) have greatly increased their importance. They are busy manufacturing centers, making silk goods, cutlery, and other articles.

MILAN possesses a magnificent cathedral (Fig. 338), built of white marble, and adorned with more than a hundred spires and fully four thousand statues. On the wall of a former monastery at Milan is Da Vinci's famous painting, "The Last Supper," copies of which are seen in many of our homes.

3. Genoa

GENOA, although separated from the Po Valley by the low northern Apennines, is the natural seaport for Milan and Turin. Since it is a port of outlet for so fertile a region, and is now connected with central Europe by railway, this city is the most important seaport in Italy.

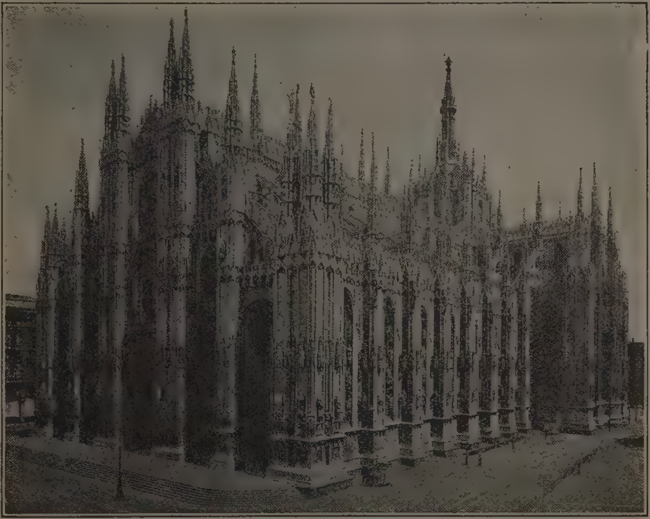


FIG. 338. — The Milan Cathedral.

4. Venice

(1) *Its location and former importance*

The principal port on the Adriatic Sea is VENICE, one of the most interesting of European cities. When hordes of barbarians were invading Italy, some of the inhabitants retreated to a number of small, marshy islands in a lagoon, protected from the sea waves by low sand bars. The descendants of these people developed into a hardy, independent race, largely through contact with the sea. Their very position forced them to become sailors; and the site of their city was favorable for commerce between central Europe and Asia. Protected from attack by land, Venice rose in power, and with power came wealth.

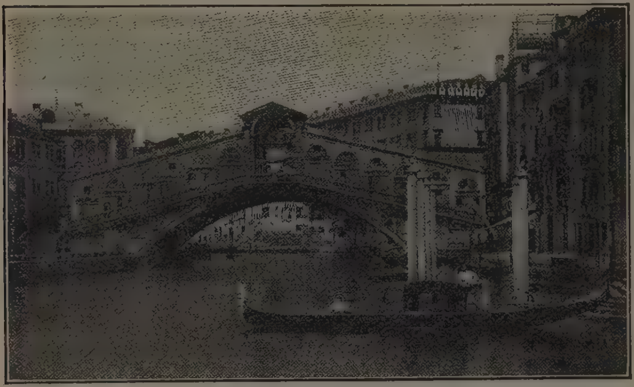


FIG. 339. — One of the canals of Venice with a gondola floating upon it.

Many beautiful houses, churches, palaces, and museums still remain to remind us of the ancient splendor of Venice.

(2) How the city is built

The city is built upon more than a hundred small islands, about two and a half miles from the mainland, with which it is now connected by railway. Canals take the place of streets. There are one hundred and fifty canals, the main one, or Grand Canal, being bordered by fine residences built of white marble, whose doorsteps lead down into the water. Nearly four hundred bridges join the different islands, and there are many narrow footpaths, but since the chief thoroughfares are canals, *gondolas* (Fig. 339) take the place of wagons, carriages, and street cars. No doubt, thousands of children in that city have never seen a horse.

Review Questions

1. Give facts about the area and population of Italy. 2. Explain the importance of its position. 3. Tell about the people, and the government. 4. Describe the surface features. 5. The climate. 6. Why is irrigation especially common in Italy? 7. Name the agricultural products. 8. How does malaria interfere with agriculture? 9. State the principal facts about fishing and mining. 10. Manufacturing. 11. Describe the beauty of the location of Naples. 12. State the reasons for the dense population here. 13. Tell about Mount Vesuvius; its history and attraction. 14. Locate Palermo. 15. State the advantages of the location of Rome. 16. What about malaria in its vicinity? 17. What are its present attractions? 18. Locate and state the principal facts about Florence. 19. Milan and Turin. 20. Genoa. 21. Venice.

Suggestions

1. Why should Italy have been much more important in former times than now? 2. What colonies has Italy in eastern Africa (Fig. 386)? Suggest reasons why Italy has so few colonies. 3. What must have been the influence upon Genoa and Venice of the discovery of the ocean route to India? Why? 4. What must have been the influence of the Suez Canal? Why? 5. Mention advantages and disadvantages of life in Venice. 6. Mention some of the uses of sulphur. 7. Make a post card collection of the different famous pictures of the Madonna. 8. Find out about the Catacombs of Rome; the Appian Road; the Aqueducts. 9. Find some facts about Cæsar, Cicero, Dante, Leonardo da Vinci, and Michael Angelo. 10. Where was Columbus born?

XI. AUSTRIA-HUNGARY (Fig. 315)

Map study

1. Compare Austria-Hungary with Germany in area. 2. In population. 3. In number of large cities. In which country, therefore, should you expect to find the greater development? 4. How much of the boundary is formed by water (Fig. 315)? 5. What countries border this empire? 6. What portions are mountainous? 7. What about the variety of climate? 8. What sections do not belong to the Danube basin?

Surface features

Austria-Hungary is one of the most mountainous countries in Europe. It includes the eastern half of the Alps (Fig. 340), besides several other ranges. These mountains form a circle in-

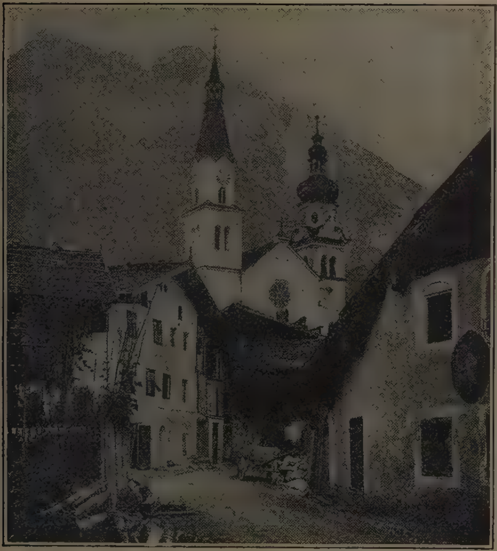


Fig. 340. — An Austrian village with mountains in the background.

closing a broad level area (Fig. 272), called the Hungarian plain, through which the Danube River flows. The encircling mountains are broken at only two points, — once near Vienna, where the Danube enters the Hungarian plain, and again on the southeastern boundary, where that river leaves it.

Climate

In so mountainous a country there are naturally many different kinds of climate. Everywhere except on the higher mountains, however, the temperature is favorable for the growth of grains and other crops of temperate latitudes; that is, the summers are warm and the winters are cold, but the difference between summer and winter is much greater than in England. Why?

The rainfall of the lowlands, which averages little over twenty inches, is barely enough for agriculture, and there are, therefore, occasional summer droughts in some places.

People

1. The mixture of races

There are many different kinds of people in this country, with very different customs and languages. For instance, about a fourth of the population, mainly in Austria, are of German stock. Magyars, descendants of Mongolian invaders, form over half of the population of Hungary. But races related to the Slavs of Russia are more numerous than either of these. There are also many Italians, as well as other peoples. German is the official language, and is spoken by the educated classes; but at least a dozen languages are spoken in the empire, and even two or three in a single town.

2. Reason for such a mixture

One reason for this mixture of peoples is the rugged country, with many inclosed valleys, in which the people have developed different customs. A second is that the empire has been increased in size by conquest. For example, note the country nearest Russia, north of the Carpathian Mountains. Here

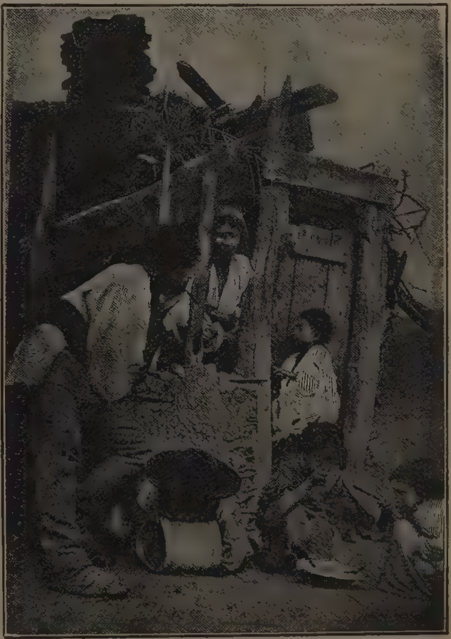


Fig. 341. — A family of gypsies and their house, in Austria.

the boundary line cuts across a plain, instead of following mountains, as it does for a large part of its length. This plain is a part of the ancient Kingdom of Poland, which once stretched from the Baltic Sea to the Carpathian Mountains. When Poland was conquered and divided among Russia, Germany, and Austria (p. 285), this, the smallest portion, was Austria's share.

A third reason for such a mixture of races is found in the central position of the empire. On that account people have entered it from various directions, and remained there. Thus it happens that Italians have pushed in from the southwest, Germans from the northwest, Russian Slavs from the north, and Magyars from the east.

Government

It has been a difficult matter to bring all these people under one government. Nevertheless, in 1867, the Austrian Empire and the Kingdom of Hungary were united, under Emperor Francis Joseph, to form the Empire of Austria-Hungary. Each of the countries has its own constitution, makes its own laws, and is independent of the other in most respects. But they work together in matters of common interest, such as the army and navy, foreign affairs, and finance.

Lumbering and agriculture

Many of the mountain slopes are forest-covered, and wild animals are still found in the remoter parts. Since nearly a third of the empire is wooded, lumbering forms one of the important industries.

Where the woods have been cleared away from the mountain slopes, there are pastures for sheep and goats. Cattle are also raised, especially on the lowlands.

Near the Adriatic, and in the warmer valleys, there are many vineyards; and the mulberry tree is raised to furnish food for the silkworm, as in Italy (p. 304) and southern France (p. 268). Flax, hemp, potatoes, sugar beets, and tobacco are other important crops. But the grains, especially wheat, rye, barley, oats, and corn, are the staple agricultural products of both Austria and Hungary. The broad plains of the Danube form one of the leading wheat-producing regions of Europe. So much wheat is raised that a large amount is exported.

Mining

There is much mineral wealth in the mountains, including deposits of salt, gold, silver, lead, mercury, and copper. There are also precious stones, such as the Hungarian opal, which is celebrated for its beauty. The excellent quality of the clays has made possible the manufacture of fine porcelain ware; and the mineral quartz supplies the material for the Bohemian glass blowers, who make some of the finest glassware in the world. This glass is beautifully colored by adding small quantities of mineral substances, such as silver, copper, and cobalt, which are mined in the country.

Iron ore is widely distributed; and Austria-Hungary ranks fourth among the coal-producing countries of Europe. Some of the best deposits are in the northwest, near PRAGUE; this explains why that city is extensively engaged in iron manufacturing. Petroleum is also found in this empire.

Manufacturing
1. Its extent, and kinds

There is much less manufacturing in Austria-Hungary than in Great Britain, Germany, or France. Yet there are numerous cotton, woolen, flour, and paper mills, iron manufactories, and beet-sugar refineries. There is also much silk weaving. The chief manufacturing region is in the northwest, near Germany, while the principal agricultural sections are in the central and eastern parts.

2. Reasons for so little manufacturing

While there has been much progress in manufacturing in recent years, one reason for so little is found in the lack of education among the people. Much of the manufacturing is still done by hand, or by very simple machines.

Another reason for so little manufacturing is that conveniences for transportation are so poor. Since the Danube cuts through the mountains on both the east and the west side of the empire, the most natural trade routes lead either down this river into the Black Sea, or else northward and westward into Germany, and thence down the Elbe or Rhine valleys. The fact that the Danube is navigable from Germany to its mouth adds greatly to the value of these routes. But goods taken in either direction must pass through foreign ports. What disadvantage do you see in that fact?

The outlets by sea are still less convenient. Although Austria-Hungary is next in size to Russia among European nations, it has but little seacoast. Estimate its length. And, what is still worse, the coast is very difficult to reach from the interior on account of rugged mountains that rise from the very seashore. Largely for this reason the ocean commerce of the empire is much less than that of other large European countries. By far the greater part of the foreign trade is carried on through German ports. One can readily understand, therefore, why Austria-Hungary has comparatively little manufacturing, and no large colonies.

Principal cities

While there are many small cities in this empire, there are surprisingly few large ones. The two largest, Vienna, the capital of Austria, and Budapest, the capital of Hungary, are on the Danube River and not on the seacoast. The reasons for this have just been suggested. State them.

1. Vienna

Vienna, which is larger than Philadelphia, is the greatest city in Austria-Hungary and the fourth in size in Europe. The main reason for its size is the fact that it is the capital of a great empire, and is located on a large river in the central part of Europe. Moreover, it is situated at an opening between mountains, through which, from the earliest times, the best routes have passed from western Europe to Asia, and from northern Europe to the Mediterranean. The railways which lead from Petrograd to Rome, and from Berlin and Paris to Constantinople, converge toward this point, making the city a great railway and trade center.

Fig. 342. — A view in Vienna showing some of the fine public buildings.

2. Budapest

Budapest, consisting of two towns (Buda and Pest), on opposite banks of the Danube, is the seat of the Hungarian government and the home of the Emperor for a part of each year. The city lies on the edge of the fertile wheat-raising plains of the Danube, and, like Odessa on the Black Sea, is engaged in flour manufacture and grain shipment.

3. Prague

Prague, the third city of Austria-Hungary, is situated on the navigable Elbe, which has been an important trade route since early times. Located in the midst of a rich mineral region, it is a noted manufacturing center.

4. Trieste and Fiume

Trieste is the largest Austrian seaport. Although separated from the main part of the country by mountain ranges, it is connected with the interior by a railway. The pass which this railway follows in crossing the mountains was the route of entrance to the Danube Valley, even as far back as the time of the Roman Empire. Fiume, southeast of Trieste, has an excellent harbor, but has little trade and is a small town.

Liechtenstein

On the boundary between Austria and Switzerland is *Liechtenstein*, a very small independent country united with Austria-Hungary by a customs treaty.

Review Questions

1. Describe the surface features of this empire. 2. The climate. 3. Tell about the mixture of races here. 4. Give reasons for such a mixture. 5. What is the nature of the government? 6. State the principal facts about lumbering and agriculture. 7. Mining. 8. The extent and kinds of manufacturing. 9. Give reasons why there is so little manufacturing. 10. Locate and give the principal facts about Vienna. 11. Budapest. 12. Prague. 13. Trieste and Fiume. 14. What and where is Liechtenstein?

Suggestions

1. What is the relative importance of the Danube and the Rhine rivers? 2. Find some Bohemian glass, to see how beautiful it is. 3. In an atlas look up Austria-Hungary to find the portions which are called Tyrol, Moravia, Bohemia, Bosnia, Herzegovina, and Transylvania. 4. Look up some facts about the history of Poland. 5. Find out something about the Triple Alliance. 6. Read about the influence of Emperor Francis Joseph in holding the different parts of the empire together. 7. Find out something about Kossuth.

XII. THE BALKAN PENINSULA (Fig. 271)

Map study

1. What countries border Roumania (Fig. 271)? 2. Name the countries south of the Danube. 3. What does the relief map (Fig. 273) tell you about the surface of each? 4. What can you expect as to the temperature on this peninsula? Why? As to the rainfall? Why? 5. Compare the number of large cities with the number in Germany and Italy. What conclusions do you draw concerning the occupations of the people? 6. Compare the area of Turkey in Europe with that of your own state.

Boundaries and surface features

This double-pointed peninsula, called the Balkan Peninsula, is bounded on one side by the Adriatic and Mediterranean seas, on another by the Ægean and Black seas; but, unlike other European peninsulas, it has a very long land boundary. Trace this boundary.

Throughout almost its entire extent the surface of the Balkan Peninsula is mountainous, a condition which offers an explanation of the large number of separate countries here. How? Many of the valleys are suited to agriculture, the most extensive being the plains of the Danube in Roumania and Bulgaria.

Climate

The climate varies greatly from seashore to interior, and from valley to mountain. Along the southern coast the winters are mild, as elsewhere near the Mediterranean. But in the northeast, near Russia, hot summers are followed by cold winters, when icy winds sweep down from the Russian steppes and the Danube freezes over.

In so mountainous a land there is also much variation in rainfall. On the western slopes — for example, near the shores of the Adriatic — there is an abundance of rain; but on the east coast and in the interior valleys, especially in Greece, there is so little rain that agriculture depends upon irrigation. Why is this true of Greece especially (p. 244)?

Closeness to Asia; effects on plants, animals, and people

The eastern branch of the Balkan Peninsula comes so close to Asia that it has been called a "bridge" between Europe and Asia. At two points, the Dardanelles and the Bosporus (Fig. 345), the continents are separated only by narrow straits. Animals and plants have crossed these barriers so easily, that there is a mixture of European and Asiatic species in that part of Europe.

This region has also been a bridge for the passage of many peoples. Romans, various tribes of Slavs, and finally the Mohammedan Turks from Asia, have brought the Balkan Peninsula under their rule. Wherever the Turks went, they brought ruin; and for four centuries, while the rest of Europe was advancing, they held this region in such control that almost all progress was checked. During the nineteenth century, however, many of its people have thrown off the Turkish yoke, so that the peninsula is now divided among several nations, and Turkey in Europe is less than one quarter as large as it was a hundred years ago.

Countries now occupying the peninsula

Aside from Turkey, the separate countries that have been formed are Albania, Montenegro, Servia, Roumania, Bulgaria, and Greece. Each of these is now entirely independent. Albania is a new state. It was formed in 1913 from territory taken from Turkey.

FIG. 343. -- A Roumanian peasant in native costume.

Montenegro

The tiny country of Montenegro, which is smaller than the state of Connecticut, has maintained its independence largely because of its situation among the mountains. The country is of slight importance; its soil is so poor that there is little agriculture; there is less manufacturing, and not a single railway. The principal occupation is cattle raising. CETTINJE, the capital, has a population of less than five thousand.

Servia

1. Agriculture

Bordering on southern Hungary, Servia shares some of the advantages of that country. Since much of its surface is rugged and heavily forested, only a small portion is cultivated. Among the leading products are corn, wheat, and other grains, reminding us of Hungary. There is also much fruit, especially grapes and plums, which, when dried, are sold as raisins and prunes. Many cattle, sheep, and pigs are raised for export, the pigs being allowed to roam in the oak and beech forests. Why here?

2. Other industries and chief city

The industries of Servia are only partly developed. For example, although coal, iron, lead, silver, gold, and other metals are known to exist, there is very little mining; nor is there much manufacturing. It will require more time to recover from the centuries of Turkish misrule.

The capital of the kingdom is BELGRADE, a city finely situated upon the Danube, and owing its importance partly to easy transportation on that river.

Roumania and Bulgaria

1. Agriculture

These two countries have much in common, although the Danube separates them for a long distance. They together control its lower course, a fact of much importance to Austria-Hungary. Why?

Broad plains, suited to agriculture, border the Danube in both countries, though the plains are far more extensive in Roumania than in Bulgaria. Naturally, therefore, there is much farming. In both countries wheat and other grains are among the chief crops. The warmer climate of Bulgaria, south of the Balkan Mountains, permits the culture of products that cannot

FIG. 344. — A Turkish woman in Constantinople.

be raised in Roumania; for example, the mulberry for the silkworm, and roses for the valuable perfume, attar of roses.

Many sheep, as well as other live stock, are raised in each country; in fact, herding is almost the sole industry on the barren steppes of eastern Roumania.

2. Other industries; also chief cities

There are large tracts of forest in each country; but there is more in Bulgaria, owing to its rugged surface, than in Roumania. Each country has valuable mineral deposits; but, as in Servia, there is little mining. Nor is there much manufacturing, except such hand work as the manufacture of Turkish rugs.

With such slight development of the resources, there are few large cities. By far the largest is BUCHAREST, the capital of Roumania. Find the capital of Bulgaria.

Turkey in Europe

1. Character of the people, and of government

The Turks, who are Mohammedans, have ideas and customs that are very unlike those of other Europeans. They are unprogressive, and are unwilling to grant rights to the many Christians who live in Turkey. Their ruler, or *Sultan*, until recently has had absolute power, which he has often used very cruelly; and the government has been the worst in Europe.

2. Chief city

(1) *Its location*

CONSTANTINOPLE, the capital of the Ottoman Empire, as Turkey is often called, has been famous for many centuries. Being situated on the beautiful, river-like outlet of the Black Sea, called the Bosporus (Fig. 345), it commands the channel through which the commerce of the Black Sea must pass. This is a natural site for a city; for it is the point where the crossing can best be made from Europe to Asia.

After being captured by the Turks, how-

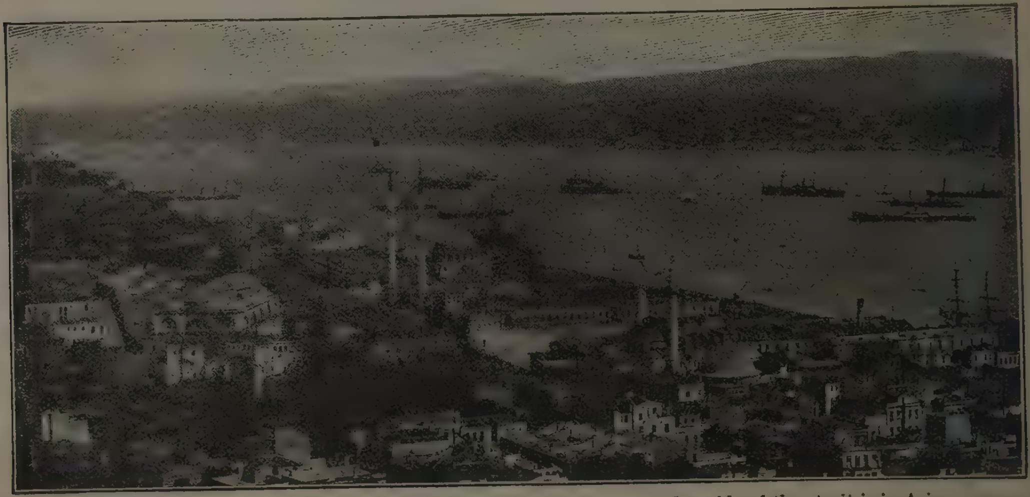


FIG. 345. — Constantinople and the Bosporus. The land on the other side of the strait is in Asia.

(2) Its history and present importance

ever, Constantinople lost much of its beauty; but some of the ancient splendor still remains (Fig. 345). There are palaces, mosques, and other interesting and costly buildings; but side by side with them are the dwellings of the common people, who live in the most squalid poverty. The houses, street scenes, people, and customs remind one of Asia rather than of Europe. How does it rank in size with other large European cities? With the large cities of the United States? (See table, Appendix, p. 392.)

Dissatisfaction with the Turkish Government finally led (1912) to war. On the one side was Turkey and on the other four of the Balkan states — Bulgaria, Servia, Montenegro, and Greece. These states were called the Balkan Allies. In this war the allies were successful and took from Turkey most of her territory in Europe. Part of this territory was formed into a new state about the size of Vermont, called Albania. The rest of the territory was divided among the allies so that each state increased its size to a considerable extent.

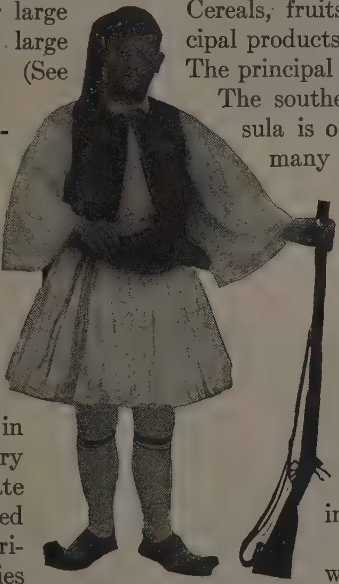


Fig. 346. — A Greek peasant in native costume.

In this division Greece came into possession again of the many islands that were formerly under her government. Servia, although failing to secure a seaport on the Adriatic, gained control over new territory almost equaling her former area. Bulgaria is now about as large as the state of Pennsylvania. It gained considerable territory lying along the Black Sea. Montenegro obtained some territory from Bulgaria but is still the smallest state on the Balkan Peninsula.

The settlement of the Balkan question promises improved conditions in the Balkan countries. The governments of the countries seem now to be firmly established, the industry and commerce are developing, and the people seem contented.

Albania

The new state of Albania extends from the boundary of Greece to the boundary of Montenegro and lies close along the Adriatic Sea. It has a pleasant climate with plenty of rainfall. The soil is fertile and suited to agriculture. Cereals, fruits, and tobacco are the principal products. Cattle and sheep are raised. The principal town is SKUTARI.

Greece

1. Surface and climate

The southern end of the Balkan Peninsula is occupied by Greece. Owing to many short mountain ranges, extending in different directions, the surface of Greece is quite rugged, and large sections are unfit for farming. Yet there are many small, fertile valleys. The coast line is very irregular, with numerous peninsulas, islands, deep bays, and fine harbors, formed by the sinking of the irregular land.

The Mediterranean causes a warm, pleasant climate, as in southern Italy. In Greece, however, as in Italy, the rainfall, which is moderate in winter, is so light in summer that irrigation is necessary for agriculture.

2. Principal industries

In this little country there are few natural resources. There is no coal, and therefore little manufacturing. There is some mining, as of iron ore, lead, and zinc; but the principal occupations are herding and farming. Large numbers of sheep and goats are raised; and the chief farm products are grain, tobacco, olives, and fruits. Among the latter is the small variety of grape known as the currant. Currants, together with raisin grapes, are cultivated in

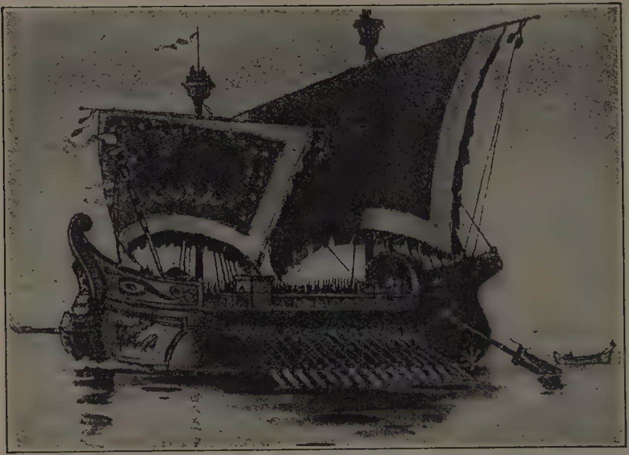


FIG. 347. — A Greek ship, used 700 years before Christ. Besides sails, long oars were used for driving the boat through the water.

large quantities on the steep hillsides; after being gathered they are spread out to dry, and are marketed as dried fruit.

The neighborhood of the sea has led the Greeks to continue their seafaring life, and they still carry on an extensive foreign trade. Many are also engaged in fishing, and in securing bath sponges from the shallow sea bottom among the Greek islands.

3. Leading city

ATHENS, the capital and most important city, with about a hundred and sixty-seven thousand inhabitants, is situated inland six miles from its port, PIRÆUS. The principal streets of the present city are quite modern; but ruins of ancient Athens are still numerous. The most noted buildings, and some of the

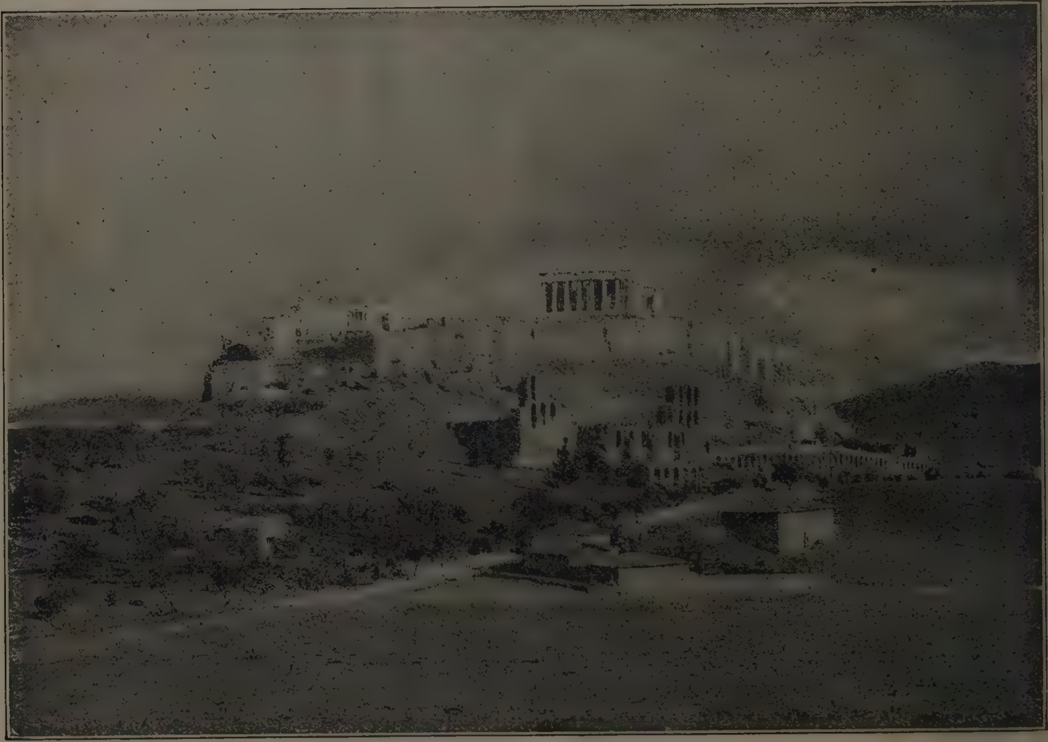


FIG. 348. — The Acropolis at Athens

finest temples of ancient Greece, stood upon the Acropolis (Fig. 348), a level-topped rocky hill with steep sides. This stronghold was the natural center of settlements on the surrounding plain.

Islands near Greece

The many islands in the neighborhood of Greece are either mountain crests or volcanic cones. Now and then we hear of an earthquake shock in this island region, or archipelago, showing that the mountains are still growing. The largest island near Greece is *Crete* (Fig. 271), which, like the smaller islands, is inhabited mainly by Greeks. It is still controlled by the Turks. The inhabitants are engaged in industries similar to those of Greece.

Review Questions

1. Describe the boundaries and surface of the Balkan Peninsula. 2. The climate. 3. How close is this peninsula to Asia, and what have been some of the effects of this location on plants, animals, and people? 4. What countries now occupy this peninsula? Locate each. 5. Tell what you can about Montenegro. 6. About agriculture in Servia. 7. What are the other industries? 8. Name and locate the chief city. 9. What are the agricultural products of Roumania and Bulgaria? 10. What are the other industries? 11. The chief cities? 12. What can you tell about the character of the people and government of Turkey in Europe? 13. What are the industries? 14. Why is the location of its chief city so favorable? 15. State the history and present importance of this city. 16. Describe the surface and climate of Greece. 17. What are the principal industries? 18. Tell about the leading city. 19. What about the islands near Greece?

Suggestions

1. What reasons can you suggest for the fact that these eastern countries are in a constant state of unrest? 2. Turkey is sometimes referred to as the "sick man of Europe." Why? 3. How was Greece well situated for the trade of the ancient world? 4. What reasons can you suggest for the fact that ancient Greece was divided into several independent states, not unlike our own, but lacking a federal union? 5. Name the principal cities in the Balkan Peninsula, and locate each.

General review questions and comparisons with North America

1. Compare the climate of western Europe with that of the west coast of North America (p. 197). 2. Make the same comparison for the eastern parts of the two continents. 3. What European countries were covered, either wholly or in part, by an ice sheet in the Glacial Period (Fig. 270)? 4. Does Europe or North America have the advantage in regard to irregular coast line? How is it an advantage? 5. Name and locate the principal mountain ranges in each continent. Which continent has the advantage as to the direction of the ranges? Why (p. 243)? 6. Name and locate the principal rivers in each continent. Which are the largest in each case? 7. Draw an outline map of Europe, inserting the boundaries and names of the countries. 8. How do our larger Western States compare in area with France and Germany? In population? 9. Which are the two or three most progressive countries of Europe? Give reasons. 10. What is the prevailing kind of government in Europe? In North America? 11. Which European country has the best location for world commerce? Why? 12. Which is best situated for continental commerce? Why (p. 286)? 13. Which country of North America has the most favorable position for trade? How? 14. Compare in population the five largest European cities with the five largest in North America (Appendix, p. 392). 15. State the main advantages of the position of each of these ten cities. 16. Name and locate the five largest seaports of Europe (Fig. 271). 17. How do they compare in population with New York, Galveston, Philadelphia, Boston, Baltimore, and San Francisco? 18. Name and locate the five largest interior cities, and compare their population with that of Chicago, St. Louis, Cleveland, Buffalo, and Cincinnati. 19. What cities of Europe and North America are near the 46th parallel of latitude? The 50th? The 60th? 20. Name some agricultural products common to both Europe and the United States. 21. Name others that are found in the United States, but not in Europe. Why this difference? 22. Name the chief wheat-producing countries of Europe. 23. In what countries of Europe is raw silk produced? Why do we not raise silkworms? 24. In what countries are sugar beets extensively produced? 25. In what countries is most lumber obtained? 26. Make a list of the European countries which have extensive coal deposits. 27. Which countries have little or none? What is the effect on the industries in each case? 28. Which countries have little or no mining? 29. Which countries have important manufacturing industries? Which have very little manufacturing? Give reasons for this difference. 30. With which group would the United States be classed with regard to mining and manufacturing?

PART V. ASIA, AFRICA, AUSTRALIA, AND ISLAND GROUPS

I. ASIA

Map study

1. Through what zones does Asia extend (Fig. 351)? 2. Where are the highest mountains and plateaus? 3. What large rivers have their sources in that region? In what direction does each flow? 4. In what sections are there extensive plains (Fig. 352)? 5. What large inland seas and lakes do you find which have no outlet? 6. What three large peninsulas are on the southern side? 7. What two are on the eastern side? 8. What islands lie east of Asia? 9. Name the large gulfs and seas along the coast. 10. How does Asia compare in size with Europe? 11. Find Asia on the globe. 12. How could you reach it, if you wished to go there? 13. What strait separates Asia from America? 14. What is the name of the isthmus connecting Asia and Africa?

1. General Facts about Asia

Size and position

Asia, the largest of the continents, includes almost one third of the land of the globe. Its immense area is shown by the fact that it reaches from near the equator to a point halfway between the Arctic Circle and the North Pole. How many degrees of latitude is that? How many miles? In what zones, therefore, does Asia lie? Is the same true of any other continent?

Find the Isthmus of Suez, which connects Asia with Africa. At one point Asia reaches within fifty miles of North America. Find that place. What is the name of the strait separating these two continents (Fig. 2)? The distance from the Suez Canal to Bering Strait is six thousand miles. There are so many degrees of longitude included in this distance, that, according to our plan for standard time, one would need to change his watch ten different times in traveling over the distance. How many changes are necessary in crossing the United States (Fig. 226)?

Surface features

1. Direction of mountains

Asia resembles Europe in the irregular arrangement of its mountains (Fig. 353). While many of them extend east and west, there are others running nearly north and south. Point out examples of each.

Northern and western Asia form a vast plain, and there are other smaller plains and low plateaus; but a large part of the continent consists of mountains and high plateaus. Indeed, more than one twelfth of Asia, mainly in the central part of the continent, has an elevation above ten thousand feet.

2. Principal lowlands and highlands

Here are found the Himalayas (meaning abode of snow), whose loftiest peak, Mount Everest (29,002 feet), is the highest in the world. Locate it. Here, too, are other ranges with peaks rising above valleys whose bottoms lie eleven thousand feet above sea level, or higher than most mountains. Between the mountains are tablelands, like that of Tibet, which has an elevation of from ten thousand to fifteen thousand feet, some portions being as high as the loftiest peaks of the Alps.

3. The rivers

The mountains and high plateaus of central Asia are the source of many large rivers. Why? Note how many rise on the margin of this central highland and flow east, south, and north, to the sea. Name and trace each of the large rivers (Fig. 352). Through what countries do they flow? Which of these rivers are probably least useful? Why?

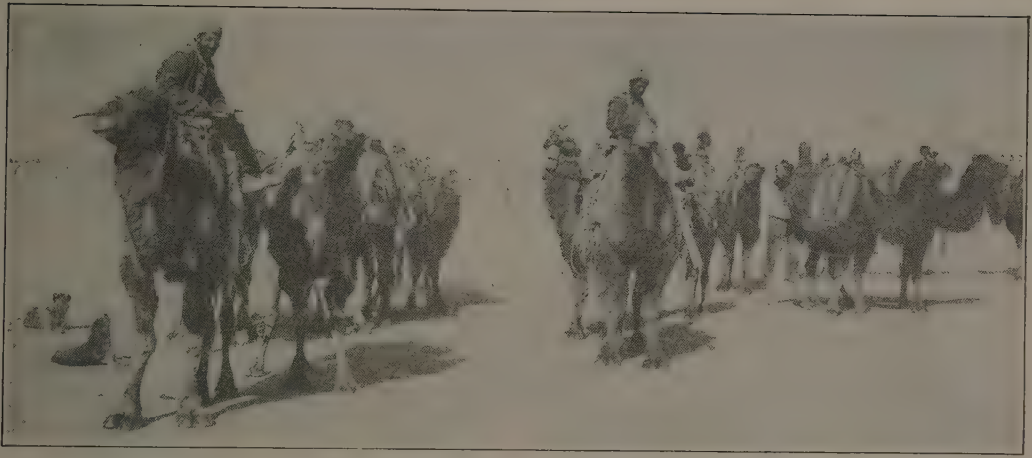


FIG. 349. — A caravan on the desert of Persia.

Climate

In so vast a land, with such differences in elevation, there is a variety of climate. Tropical heat is found in southern Asia, and here dense forests grow in the belt of calms (Fig. 381), and in those places where ocean winds blow over the land. Where winds do not blow from the ocean, however, the climate is very dry and there are broad deserts (Fig. 349). Most of western Asia is arid on that account. Much of central Asia is also arid, since the lofty mountains surrounding the central plateau cause most of the vapor to condense on their seaward slopes.

A large part of Asia has a temperate climate. Some of it has a frigid climate, like the northern parts of North America and Europe. For example, the climate at Peking resembles that of the northeastern part of the United States; and the climate of the plains of central Siberia resembles that of the plains of Minnesota and Dakota.

People

1. Their number, and their location

More than half the human race, or over eight hundred million persons, live in Asia. But in spite of this vast number, most of the continent is sparsely settled. The mountain slopes, the cold plateaus, the

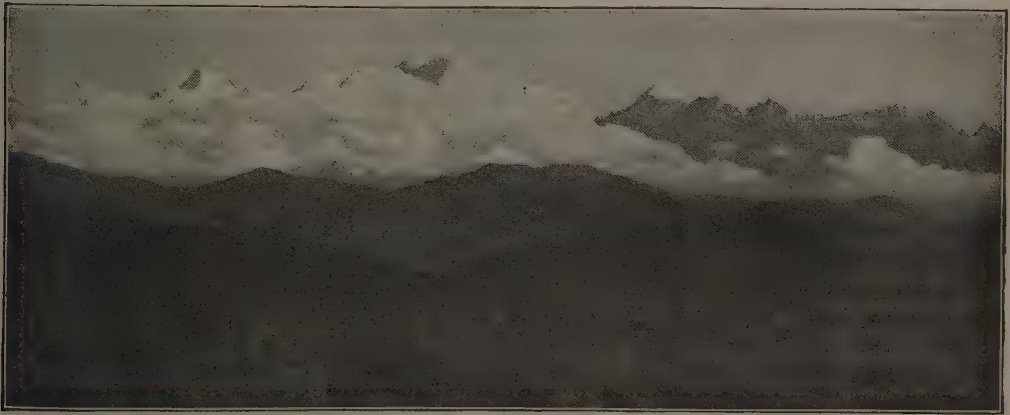


FIG. 350. – The Snowy Range in the Himalaya Mountains, the loftiest mountains in the world.

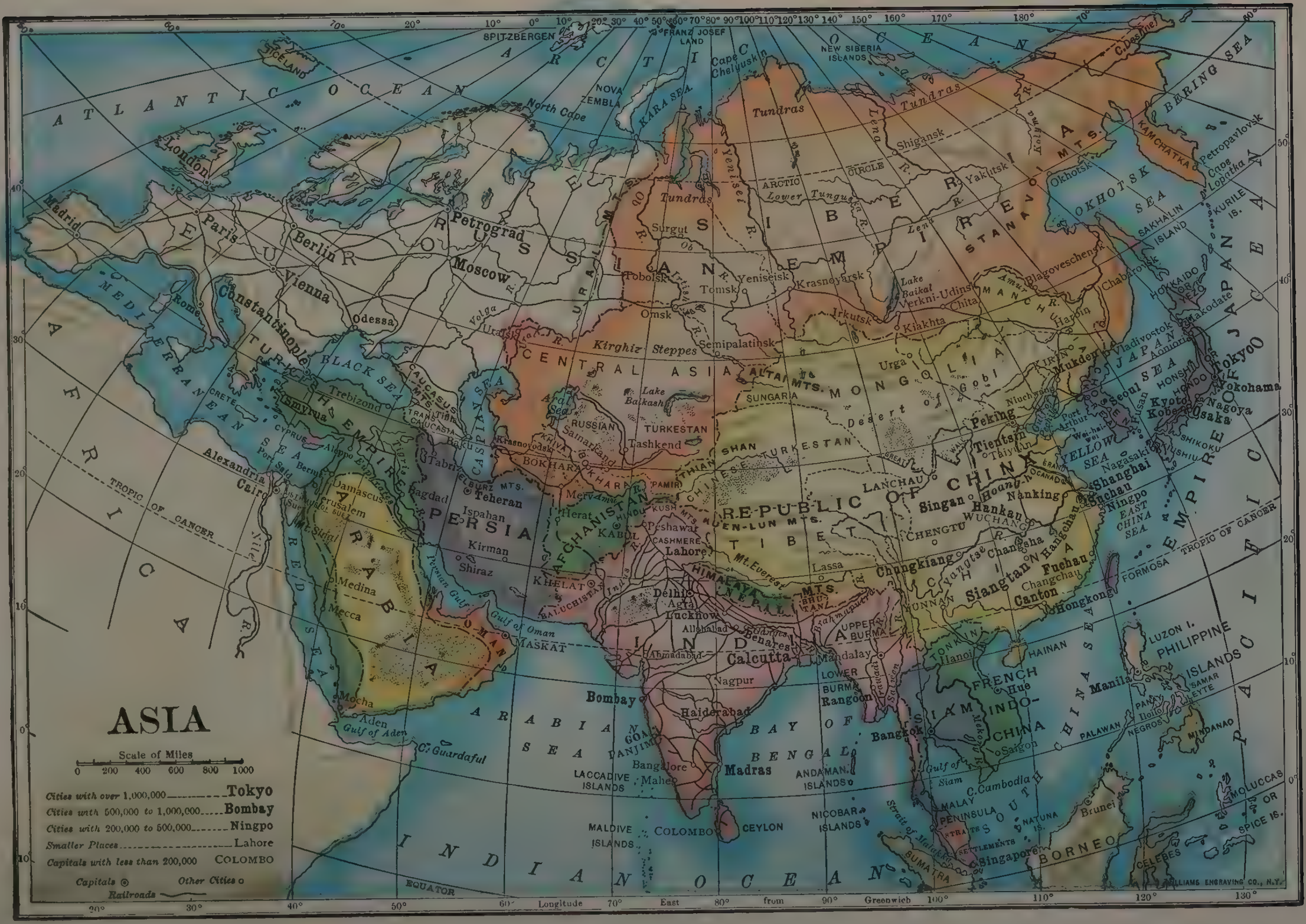

ASIA
Scale of Miles
0 200 400 600 800 1000
Cities with over 1,000,000 Tokyo
Cities with 500,000 to 1,000,000 Bombay
Cities with 200,000 to 500,000 Ningpo
Smaller Places Lahore
Capitals with less than 200,000 COLOMBO
Capitals ◉ Other Cities ○
Railroads
ARCTIC OCEAN
ATLANTIC OCEAN
INDIAN OCEAN
PACIFIC OCEAN
AFRICA
EUROPE
RUSSIA
SIBERIA
RUSSIAN EMPIRE
CENTRAL ASIA
MONGOLIA
MANCHURIA
REPUBLIC OF CHINA
TIBET
INDIA
PERSIA
ARABIA
AFGHANISTAN
BALUCHISTAN
TURKESTAN
TURKISH EMPIRE
EMPIRE OF JAPAN
SIAM
FRENCH INDO-CHINA
PHILIPPINE ISLANDS
BORNEO
SUMATRA
MEDITERRANEAN SEA
BLACK SEA
CASPIAN SEA
RED SEA
ARABIAN SEA
BAY OF BENGAL
SOUTH CHINA SEA
EAST CHINA SEA
YELLOW SEA
SEA OF JAPAN
OKHOTSK SEA
BERING SEA
KARA SEA
TROPIC OF CANCER
EQUATOR
Longitude East from Greenwich
Tokyo
Petrograd
Moscow
Constantinople
Peking
Calcutta
Bombay
Teheran
Canton
Shanghai
Madras
Hankau
Osaka
Nanking
Delhi
Smyrna
London
Paris
Berlin
Vienna
Madrid
Rome
Odessa
Cairo
Alexandria
Tokyo
Yokohama
Kobe
Kyoto
Nagoya
Seoul
Mukden
Tientsin
Singan
Chungkiang
Siangtan
Fuchau
Hongkong
Manila
Bangkok
Rangoon
Singapore
Saigon
Hue
Hanoi
Mandalay
Benares
Lucknow
Lahore
Haiderabad
Nagpur
Bangalore
COLOMBO
Kabul
Herat
Samarkand
Tashkend
Omsk
Tomsk
Irkutsk
Yakutsk
Vladivostok
Mecca
Medina
Damascus
Jerusalem
Bagdad
Aden
Mocha
MASKAT
Lassa
Urga
HIMALAYA MTS.
ALTAI MTS.
KUEN-LUN MTS.
STANAVOI MTS.
URAL MTS.
CAUCASUS MTS.
Mt. Everest
Tundras
Kirghiz Steppes
Desert of Gobi
WILLIAMS ENGRAVING CO., N.Y.

FIG. 351.

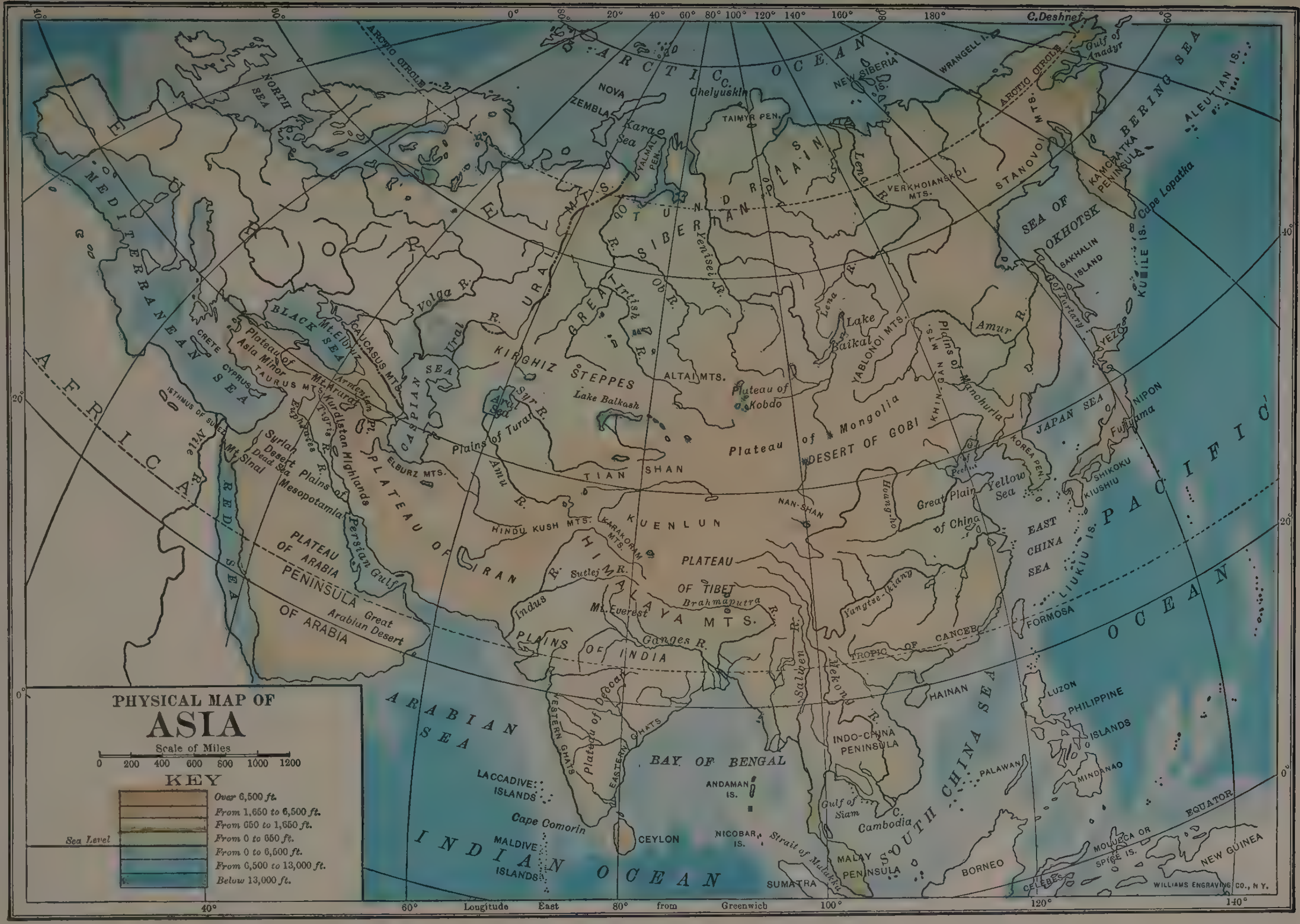
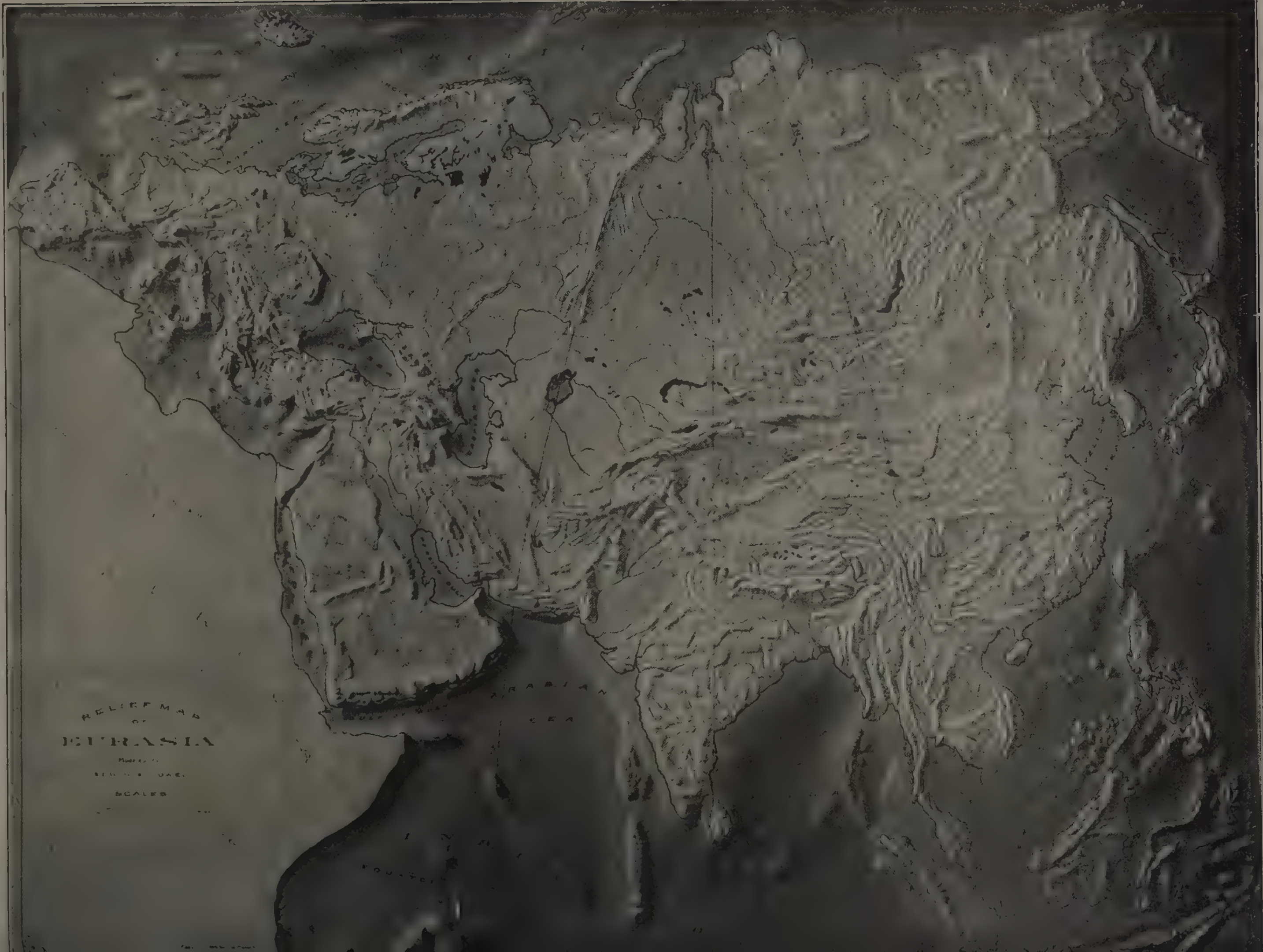

PHYSICAL MAP OF
ASIA
Scale of Miles
0 200 400 600 800 1000 1200
KEY
Over 6,500 ft.
From 1,650 to 6,500 ft.
From 650 to 1,650 ft.
From 0 to 650 ft.
Sea Level
From 0 to 6,500 ft.
From 6,500 to 13,000 ft.
Below 13,000 ft.
ARCTIC OCEAN
ARCTIC CIRCLE
NORTH SEA
EUROPE
NOVA ZEMBLA
Kara Sea
YALMAL PEN.
C. Chelyuskin
TAIMYR PEN.
NEW SIBERIA IS.
WRANGELL I.
C.Deshnef
Gulf of Anadyr
BERING SEA
ALEUTIAN IS.
KAMCHATKA PENINSULA
Cape Lopatka
STANOVOI MTS.
VERKHOIANSKOI MTS.
SEA OF OKHOTSK
SAKHALIN ISLAND
KURILE IS.
G. of Tartary
YEZO
NIPON
Fujiyama
JAPAN SEA
SHIKOKU
KIUSHIU
PACIFIC OCEAN
LIUKIU IS.
EAST CHINA SEA
FORMOSA
TUNDRA
SIBERIAN PLAIN
Lena R.
Yenisei R.
Ob R.
Irtish R.
URAL MTS.
Volga R.
Ural R.
GREAT KIRGHIZ STEPPES
Lake Balkash
ALTAI MTS.
Plateau of Kobdo
Lake Baikal
YABLONOI MTS.
Amur R.
Plains of Manchuria
KHIN-GAN MTS.
Plateau of Mongolia
DESERT OF GOBI
KOREA PEN.
Yellow Sea
Great Plain of China
Hoang-ho
Yangtse-kiang
MEDITERRANEAN SEA
CRETE
CYPRUS
BLACK SEA
Mt. Elbruz
CAUCASUS MTS.
CASPIAN SEA
Aral Sea
Syr R.
Plains of Turan
Amu R.
ELBURZ MTS.
Plateau of Asia Minor
TAURUS MTS.
Mt. Ararat
Armenian Pl.
Kurdistan Highlands
Tigris R.
Euphrates R.
Plains of Mesopotamia
Syrian Desert
Dead Sea
Mt. Sinai
ISTHMUS OF SUEZ
Nile R.
AFRICA
RED SEA
PLATEAU OF IRAN
Persian Gulf
PLATEAU OF ARABIA
PENINSULA OF ARABIA
Great Arabian Desert
TIAN SHAN
HINDU KUSH MTS.
KARAKORAM MTS.
KUENLUN
NAN-SHAN
PLATEAU OF TIBET
Brahmaputra R.
HIMALAYA MTS.
Mt. Everest
Sutlej R.
Indus R.
Ganges R.
PLAINS OF INDIA
Plateau of Deccan
WESTERN GHATS
EASTERN GHATS
ARABIAN SEA
LACCADIVE ISLANDS
Cape Comorin
MALDIVE ISLANDS
CEYLON
INDIAN OCEAN
BAY OF BENGAL
ANDAMAN IS.
NICOBAR IS.
Strait of Malakka
SUMATRA
Salwen R.
Mekong R.
TROPIC OF CANCER
HAINAN
INDO-CHINA PENINSULA
Gulf of Siam
C. Cambodia
MALAY PENINSULA
SOUTH CHINA SEA
PALAWAN
BORNEO
LUZON
PHILIPPINE ISLANDS
MINDANAO
CELEBES
MOLUCCA OR SPICE IS.
EQUATOR
NEW GUINEA
0°
20°
40°
60°
80°
100°
120°
140°
160°
180°
Longitude East from Greenwich
WILLIAMS ENGRAVING CO., N.Y.

FIG. 352.


RELIEF MAP
OF
EURASIA
SCALES
ARABIAN SEA
EQUATOR

steppes, the deserts, the forests, and the tundras support but few inhabitants (Fig. 354). Nearly seven eighths of the Asiatic people dwell near the coast, especially on the river flood plains and deltas of the south and the east.

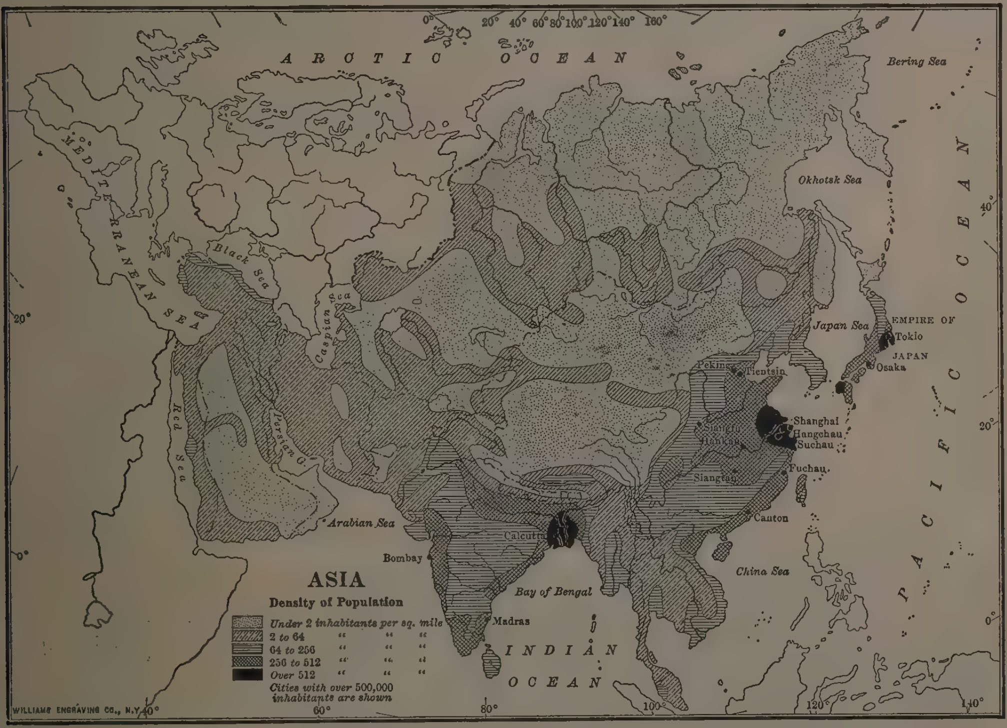


FIG. 354. — Map showing density of population of Asia.

2. Our debt to Asia for domesticated plants and animals

It was in Asia, probably the seat of the oldest civilization of mankind, that men first learned to make use of some of the animals and plants that are now so valuable. No one knows who it was that first tamed the wild animals such as the horse, the dog, and the sheep, which now are used all over the world; nor is it known who first cultivated wheat and many other useful plants; but it is certain that the people of Asia knew the value of these plants and animals long before the Europeans became civilized. Centuries before the time of Christ the people of India grew cotton and wove it into cloth; and they kept sheep, horses, cattle, and goats. Tea and oranges were introduced into Europe from China, and the lemon tree came from India.

3. Why they have fallen so far behind

In spite of their early progress, the civilization of the Asiatic people has long been at a standstill, while the Europeans were making rapid advances.

There are two reasons for this that are specially important. One is the fact that the Asiatic people have been so cut off from the rest of the world that they have been unable to learn from others. While Europeans were exploring the world in all directions, and while they were founding colonies and carrying on profitable commerce with foreigners, the people of Asia did little or nothing in these directions.

A second reason is that they have not wanted to learn from other people. Many Asiatics, like the Chinese, for example, have felt that their civilization was the best, and have therefore even refused to learn from others.

4. Signs of future progress

However, these people can improve rapidly, if they will. And there are many signs that they are now determined to do it. The Japanese and the people of India have learned much from America and Europe, and have already made great progress, and the Chinese are beginning to do so.

2. The Turkish, or Ottoman, Empire

Although Constantinople, the capital of the Turkish Empire, is in Europe, Turkey controls ten times as much land in Asia as in Europe.

Why of special interest

The part of Asia which Turkey controls is of peculiar interest to us. It is here that many of the places mentioned in the Bible are located (Fig. 356); and here Jesus was born, as well as the prophet Mohammed. It was from this center, also, that much of the ancient civilization spread along the shores of the Mediterranean.

Surface and climate

A large part of Turkey in Asia is tableland, crossed by short mountain ranges. There are also a number of extinct volcanoes, such as Mount Ararat.

There is little rainfall except along the coast of the Mediterranean and Black seas. The country is, therefore, mainly arid or desert; the streams are usually short and shallow, and there are numerous salt lakes. Point out the two principal rivers (Fig. 352).

Industries, products, and chief cities

Some of the mountain slopes are covered with forest; but most of the country is open, and suited mainly to herding, though there is some agriculture. In the valleys wheat, grapes, olives, figs, oranges, and cotton are raised, usually by the aid of irrigation. Both the herding and farming are carried on in much the same way as in the Bible times. The valuable minerals are scarcely worked at all; and there is almost no manufacturing except that done by hand (Fig. 355). Some of this work, however, especially tapestry and rugs, is very beautiful.

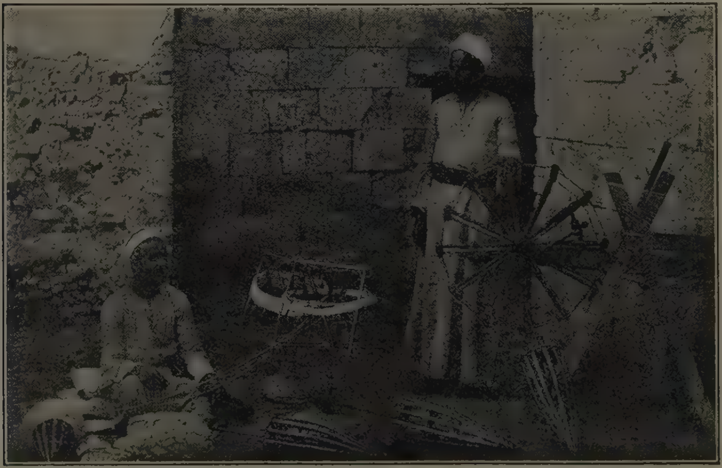


Fig. 355. — Native spinning wheels in Palestine, using the same methods as in the days of Christ.

Smyrna, the leading seaport, has a fine harbor and has been growing very rapidly now that railroads extend inland from this point. Locate it. Find Trebizond, an important port on the Black Sea.

Two especially important parts of Turkey in Asia

There are two parts of Turkey in Asia that merit special study on account of their history; namely, (1) the *Holy Land*, and (2) the valley of the Euphrates and Tigris rivers, or *Mesopotamia*.

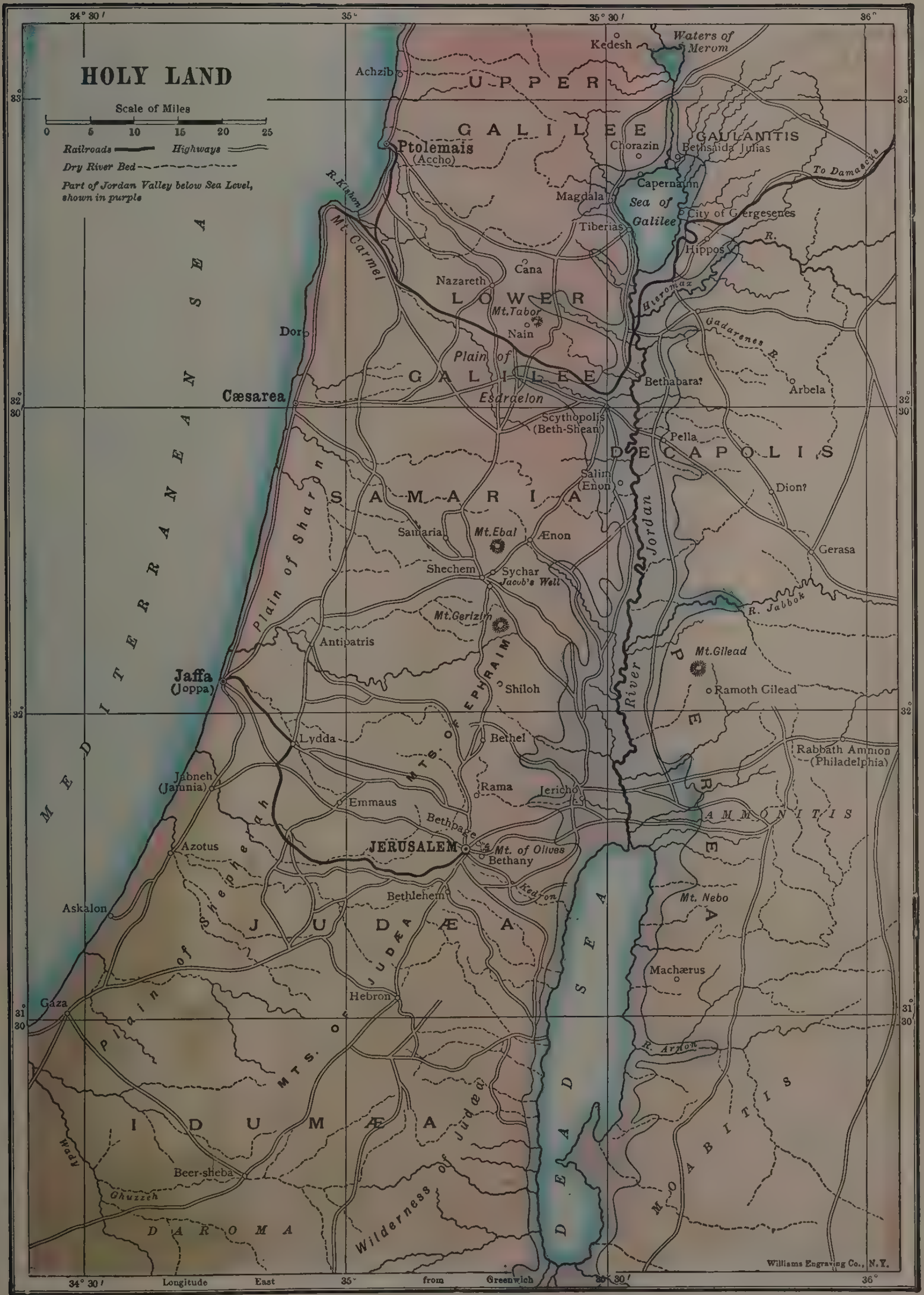

HOLY LAND
Scale of Miles
0
5
10
15
20
25
Railroads
Highways
Dry River Bed
Part of Jordan Valley below Sea Level, shown in purple
34° 30′
35°
35° 30′
36°
33°
32° 30′
32°
31° 30′
Longitude East from Greenwich
Kedesh
Waters of Merom
Achzib
UPPER
GALILEE
GAULANITIS
Chorazin
Bethsaida Julias
Ptolemais
(Accho)
To Damascus
R. Kishon
Capernaum
Magdala
Sea of Galilee
City of Gergesenes
Tiberias
Mt. Carmel
R.
Hippos
Cana
Nazareth
LOWER
Hieromax
Mt. Tabor
Gadarenes R.
Nain
Dor
Plain of
GALILEE
Esdraelon
Bethabara?
Arbela
MEDITERRANEAN SEA
Cæsarea
Scythopolis
(Beth-Shean)
Pella
DECAPOLIS
Salim
(Enon)
Dion?
SAMARIA
Plain of Sharon
Samaria
Mt. Ebal
Ænon
Gerasa
Shechem
Sychar
Jacob's Well
R. Jabbok
Mt. Gerizim
Antipatris
Mt. Gilead
EPHRAIM
Jaffa
(Joppa)
Shiloh
Ramoth Gilead
River Jordan
PEREA
Lydda
Bethel
Rabbath Ammon
(Philadelphia)
MTS. OF EPHRAIM
Jabneh
(Jamnia)
Rama
Jericho
Emmaus
Bethphage
AMMONITIS
Azotus
JERUSALEM
Mt. of Olives
Bethany
Plain of Shephelah
Kedron
Mt. Nebo
Askalon
Bethlehem
JUDÆA
Machærus
Hebron
Gaza
Plain of
MTS. OF JUDÆA
R. Arnon
DEAD SEA
IDUMÆA
MOABITIS
Wady
Beer-sheba
Ghuzzeh
DAROMA
Wilderness of Judæa
Williams Engraving Co., N.Y.

FIG. 356.

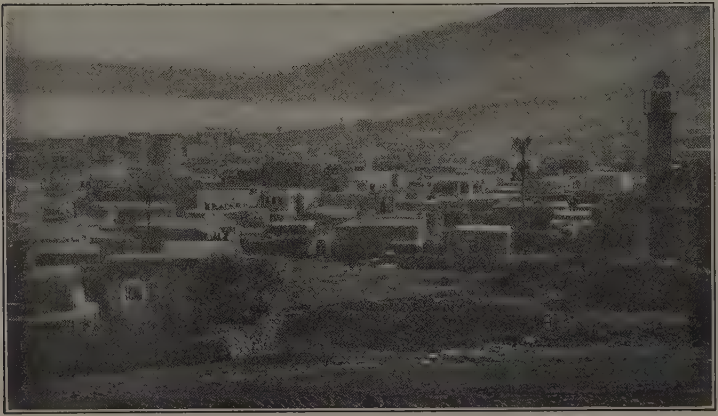


Fig. 357. — Tiberias and the Sea of Galilee in the Holy Land.

1. The Holy Land

The Holy Land has a nearly straight coast with no good harbors, and back of it is a narrow coastal plain. Beyond this are two low mountain ranges, and between them is the remarkable depression at the bottom of which is the Dead Sea. While the village of Hebron (Fig. 356), on the western mountain range, is about three thousand feet above sea level, the surface of the Dead Sea, a few miles to the east, is almost thirteen hundred feet below sea level. This is, in fact, the deepest depression on the lands of the earth.

(1) Its surface and climate

The river Jordan flows along this depression, coming out of a fresh-water lake, called the Sea of Galilee (Fig. 357), and emptying into the Dead Sea. But this is such a desert region that the water evaporates too fast for the Dead Sea to have an outlet. The sea is so salt that no living things can exist there, and the salt makes the water so dense that a person cannot even sink in it. The Jordan Valley and the Dead Sea lie no farther south than southern Alabama; yet, partly because the region is so low and inclosed, its climate is almost tropical.

(2) Important events that happened here

Before its possession by the Jews, this region was divided into small countries, often under the rule of their more advanced and powerful neighbors in northwestern Africa, the Egyptians. Then the Jews entered this "promised land" and created a kingdom which rose to its highest power under King Solomon. It was here that many of the events in the Old Testament took place, including the advance in religion from the worship of many gods to the belief in one all-powerful God. Persians, Egyptians, and Romans later ruled over Palestine; and it was during the control of the Romans that Jesus was born at Bethlehem (Fig. 358). What events in the life of

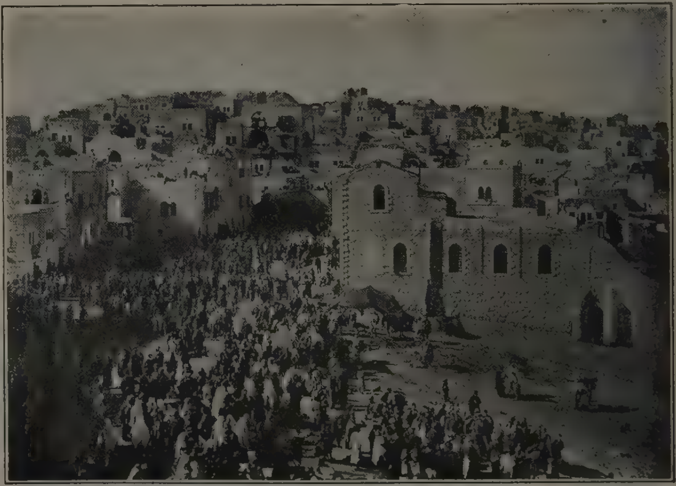


Fig. 358. — Pilgrims entering Bethlehem on Christmas day. It was here that Jesus was born.

Jesus can you mention that occurred at some of the places marked on the map (Fig. 356)?

(3) *Former products and commerce of Palestine*

At that time, as we learn from the Bible, the region was highly developed. Wheat was raised upon the uplands, and olives, figs, and grapes in the valleys, while herds of sheep were pastured on the plateaus and mountains. Recall events from the Bible that indicate these occupations.

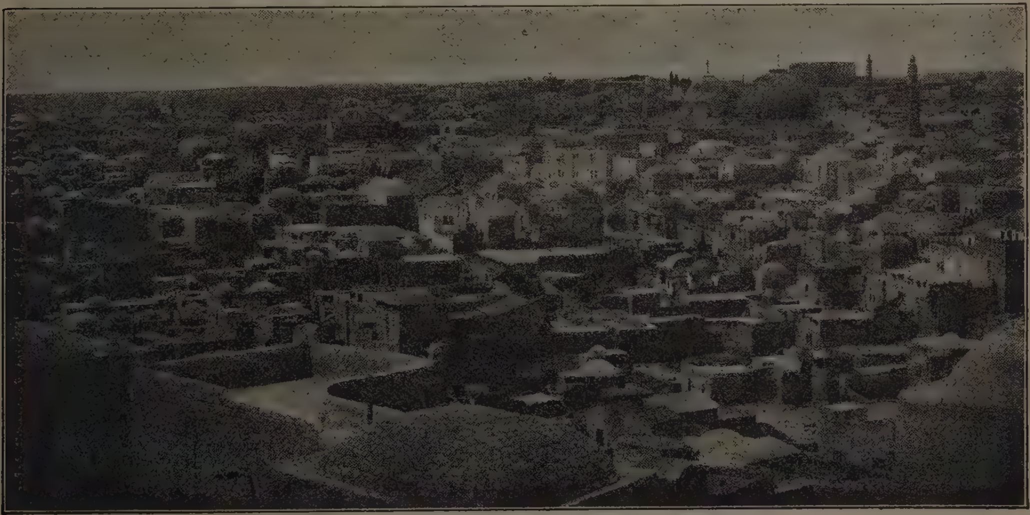


Fig. 359. — A view of Jerusalem as it appears to-day.

Palestine lay on the great caravan route which, leading from Egypt to the distant East, ran northward, as far as Damascus (Fig. 356), in order to avoid the Syrian desert. Throngs of people, therefore, passed this way. Jerusalem (Fig. 359), the capital, was a large and beautiful city, situated upon a lofty elevation that made it an important stronghold. It was famous for its public buildings, in particular the "Temple of Solomon."

(4) *Present method of travel*

Palestine is now visited by many Christians, and also by Mohammedan pilgrims who believe that Mohammed ascended to heaven from Jerusalem. Very little but ruins is to be seen, for much of the country, once "flowing with milk and honey," is now deserted. The usual mode of travel is by mule or camel, as in olden times. A short railway now climbs the mountains from Jaffa, on the seacoast, to Jerusalem, and another has been begun following the old caravan route past Nazareth, and the Sea of Galilee, to Damascus. Trace these two lines.

2. Mesopotamia

(1) *Its ancient history*

Mesopotamia, which includes the fertile valleys of the Tigris and Euphrates rivers, has suffered the same fate as the rest of Turkey in Asia. It was formerly crossed by a network of irrigation canals, and was called in the Bible "a garden of the Lord." But it has been overrun by the Arabs and Turks, until it is now almost a waste. Babylon and Nineveh, once great cities, and the seats of a wonderful civilization, are now marked only by mounds of ruins. The site of the Tower of Babel is believed to have been at Babylon, and the ruins of the palace of Nebuchadnezzar are still to be seen there.

(2) Its present importance

There is now little commerce in this land, though steamboats can go up the Tigris as far as BAGDAD. This city, situated on the caravan route to the East, was of much importance in ancient times. There is still some trade between Europe and India along this route. The building of a railroad to Bagdad will probably greatly increase its importance.

3. Arabia, Persia, and Afghanistan

Arabia

The Arabian Peninsula is an arid plateau, several thousand feet in elevation. What waters border it? The climate is hot along the coast, but cooler on the plateau and among the mountains.

There are few people in Arabia, and these are largely nomadic. Coffee is raised in the southwest, near MOCHA; the date palm flourishes in many places; and fruits and vegetables are produced in many of the valleys. Agriculture is possible in most parts only by means of irrigation. Cattle, sheep, goats, donkeys, horses, and camels are raised in large numbers.

MECCA, a city about fifty miles from the west coast, is sacred to all Mohammedans. It was there that Mohammed was born, and every Mohammedan wishes to make a pilgrimage to it at least once during his lifetime. Most of the pilgrims come by sea, and every year both the city, and the roads leading to it, are crowded with them. Now, however, a railroad to Mecca is being built.

FIG. 360.—A Persian girl in native costume.

Most of the Arabian Peninsula is independent of Turkey, though it has no well-organized government of its own. Turkey controls the west coast and the Persian Gulf coast as far as *Oman*, a small independent state, whose capital is the seaport of MASKAT. The British have control of ADEN, which is one of their most important coaling stations.

Persia

Persia, like Arabia, is an elevated tableland, with large tracts of desert that are of little or no use to man.

The best agricultural district is near the Caspian Sea, where there is rainfall enough for crops. Elsewhere the climate is so arid that irrigation is necessary for farming. The chief farm products are tobacco, wheat, barley, cotton, and opium. Much silk also is produced, and roses are cultivated for the manufacture of the perfume, attar of roses.

Nearly two million Persians belong to nomadic tribes (Figs. 349 and 361) that roam about the desert, dwelling in tents, and herding goats, sheep, and other animals.

There are some valuable minerals, including the precious stone, turquoise. Precious pearls and pearl shells are found in the waters of the Persian Gulf.

Almost the only manufacturing is that done by hand (Fig. 362); and the Persians, like the Turks, do some very beautiful hand weaving, notably of shawls and rugs. Their carving and inlaid metal work and woodwork also are very artistic.

The government of Persia has long resembled that of Turkey, and has therefore been bad. The ruler, the *Shah*, has been an absolute monarch, controlling the lives and property of his subjects, who are mostly

Mohammedans. Recently, however, there has been a popular uprising and a demand for better government. The Shah has promised a reform and has agreed to allow the people a voice in making their laws. TEHERAN is the capital and the largest city.

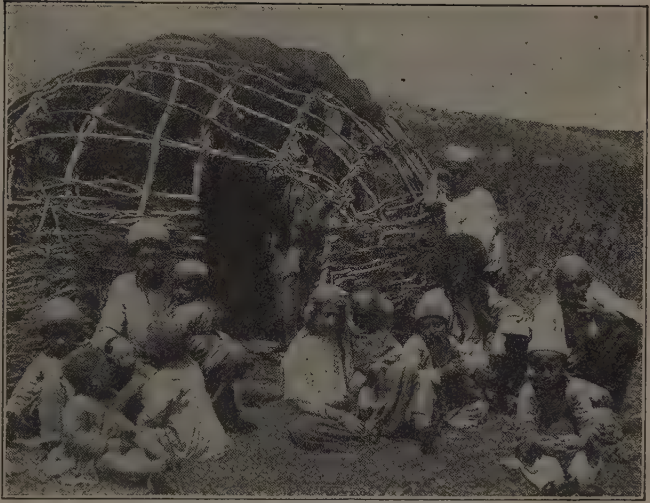


FIG. 361. — Persian nomads and their home.

Afghanistan

Afghanistan, "one of the waste places of the world," is a region of sand, bare rocks, and snow-capped mountains. Only in the valleys is the soil made to yield a harvest; and even there the cold, blustering winters and the dry, scorching summers make the worst of climates. Like other Asiatic countries so far studied, Afghanistan is badly governed. The ruler, the merciless *Amir*, keeps his authority by the terror he inspires among his subjects. Nestled among the lofty mountains is KABUL, the seat of government.

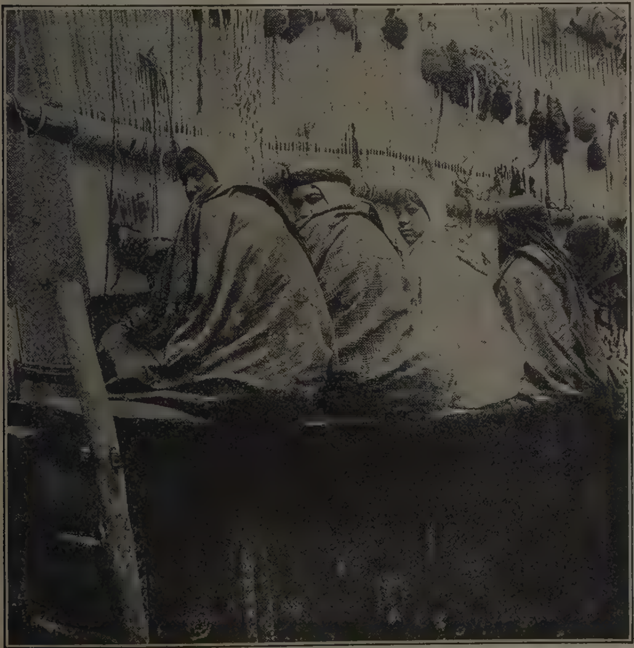


FIG. 362. — Persian women making a rug by hand. These people are so backward that they have not learned to use modern machinery; but their hand work is very beautiful.

4. Russia in Asia

This vast section of the Russian Empire includes about one seventh of the land surface of the globe.

Area and divisions

There are several divisions, such as Turkestan and the dependencies of Bokhara and Khiva in the southern part; but by far the largest is Siberia, which is a million square miles larger than Europe. It is even larger than the United States, Mexico, and Central America combined. Yet Siberia has less than one twelfth as many inhabitants as the United States alone.

In the past Siberia has had a reputation mainly as a source of

Importance in the past

minerals, and as a place of exile for Russians whom the government wished to punish. Gold has been found in a number of places, as in the Urals and near Lake Baikal, the largest fresh water lake on the continent. Other valuable minerals are found here, but as yet there has been little mining, except in the western part near Russia. The southern provinces have been of much importance in the past. Bokhara, though a Russian dependency, still has its own ruler. It was once a powerful state with highly developed industries, and today is one of the most progressive parts of Russia in Asia.

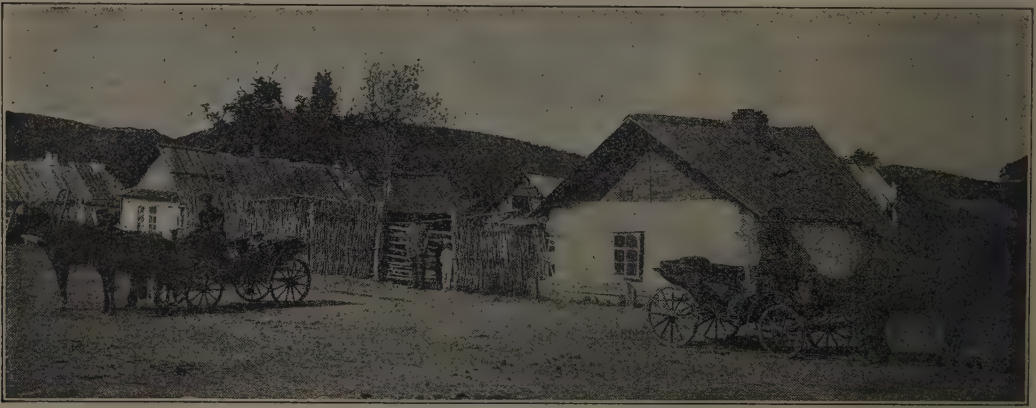


Fig. 363. — Russian carriages in a Siberian town.

Why not more important

The immense territory of Russia in Asia has great resources; but there has been little advance except in the southern part. Perhaps the chief reason for this has been the lack of transportation. For a long time there were no railroads, and the rivers have been of little use for navigation. In the arid south they are small, and in the north, though large, they flow into a frozen ocean, and are themselves frozen for many months every year. This difficulty of transportation has prevented settlement; and it has made commerce very difficult. There was no object for raising large crops, if some of the products could not be sent away and exchanged for other things.

Recent improvements, and prospects for the future

It was largely to overcome this difficulty that the Russian government built the great Siberian railway. Trace this railway (Fig. 351). How long is it? On the one side it connects Siberia with Europe; on the other with the Pacific. Other railways have been built in the southern part of the country, and still others have been planned.

Now that it is possible for people to enter this vast territory to develop farms and mines, and to ship the surplus products, Russia in Asia will doubtless advance rapidly. The one great difficulty still in the way is the bad government, which, as you have learned, is opposed to the progress of the people.

Leading cities

There are several important cities in Asiatic Russia. The largest in the southwest is Tashkend, and the city of Bokhara is next in size. Tiflis, between the Black and Caspian Seas, is really in Asia, though the Russian government classes this region with its European provinces. It is about the size of Tashkend. There are a number of other cities with a population of from fifty to a hundred thousand. In Siberia there are no large cities, though several along the railway, including

IRKUTSK and VLADIVOSTOK, are now growing rapidly.

5. Republic of China

Character of the people

1. Their early advance

Centuries before the Europeans had risen above a state of barbarism, the Chinese had developed a remarkable civilization. The art of printing, the manufacture of gunpowder, the production of raw silk goods, the baking of porcelain, or China ware, and other important arts were known to them long before the Europeans learned them.

The great wall that they built

The peculiar energy of the Chinese is shown by the great wall that they built (Fig. 364). Having the ocean as a barrier on the south and east, the country has been most open to attack from the north and west, in spite of the barriers of mountains and deserts on that side. It was probably from this direction that China was entered by the Mongolians, who now make up the main part of the population. The constant danger of invasion by nomads led, as early as 212 B.C., to the building of the great wall along the northern frontier.

This wall, twelve hundred miles long in a straight line and fifteen hundred miles with all of its windings, leads up and down hill (Fig. 364) and even over a mountain peak. It is twenty-five feet wide and thirty feet high, and every few hundred feet there are strong watchtowers rising still higher. This wonderful structure, which required armies of men to build, is now over two thousand years old; yet many parts of it are still perfect.

FIG. 364. — A view of a part of the great Chinese wall.

Their old-fashioned customs

Notwithstanding their ancient civilization, the Chinese have been outstripped by Europeans. This is largely due to the fact that the Chinese have a decided dislike for new things and new customs, as is shown in their objection to the use of labor-saving machinery, and to new methods of transportation, such as the railway. Much of the commerce of the country is carried on by means of canals (Fig. 368), of which the largest is the Grand Canal (Fig. 351), built more than twelve hundred years ago. The rivers are also used, even where it seems almost impossible for a boat to go; but poles, oars, and sails take the place of steam.

Good roads are rare, and one of the principal vehicles is the wheelbarrow, which is used even for carrying travelers. There are, for example, two thousand passenger wheelbarrows in Shanghai. Pack animals and men are employed for carrying loads and the

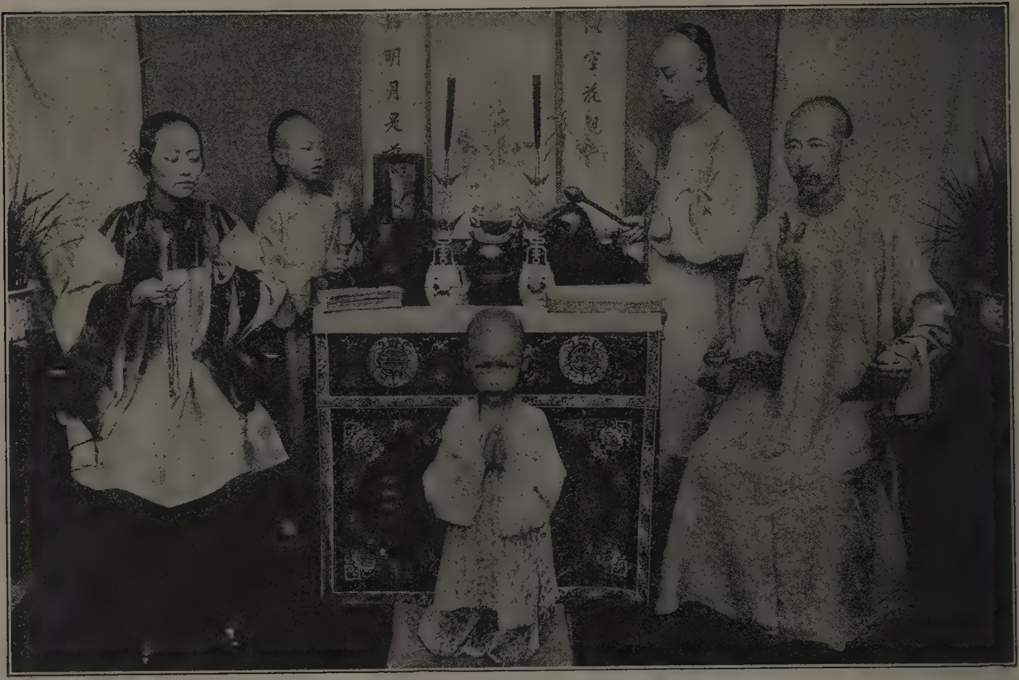


Fig. 365. — A Chinese family engaged in ancestor worship.

wealthy classes are carried in chairs by their servants. From this it is plain that a man's time in China is not valued highly.

Possible strength of China in the future
1. Area and population

It is quite possible that China will yet rank as one of the Great Powers of the earth. Her enormous population, which is larger than that of all Europe, and five times that of the United States, gives one great advantage. Her area, which is greater than that of the United States, gives her a second advantage.

The enormous population of China is not spread evenly throughout the whole country (Fig. 354). There are some sections where very few people live, either because the climate is too cold or too arid, or because the country is too mountainous. Population is sparse, for instance, in Tibet, Turkestan, and Mongolia, which together make up half of the republic. There are some sections, as in the Desert of Gobi, where even grazing cannot be carried on.

On the other hand, vast hordes of Chinese live on the river flood plains and deltas of the south and east. This is, indeed, the most densely settled large area on the globe. These flood plains and deltas are very broad and fertile, especially in the lower portions of the Hoang-ho and Yangtse-kiang rivers.

Turn to Figure 351 to note the location of China in Asia, and then observe the variations in density of population as shown in Figure 354. How much of the country is thickly populated? Find the latitude of Peking, the capital, and compare it with that of Philadelphia. What can you say about the density of population north of Peking? What is the latitude of Canton? Compare its latitude with that of New Orleans. On page 392, note the population of the leading Chinese cities.

2. Variety of climate

A third advantage which China enjoys is her great variety of climate. Observe through what zones the republic extends. How much farther south does it reach than our most southern state, Florida? How much farther north than our most northern states? Naturally, then, the variety of climate is even greater than our own, and hence the agricultural products may be even more varied. As in our country, some parts are desert, some arid, and some have abundant rainfall.

3. The surface features

There are many kinds of soil too. There are extensive plains, some of them broad river flood plains and deltas; some sections are plateaus, and there are also lofty mountain ranges.

In so large a country, with so many differences in climate, soil, and surface features, there are certain to be many resources. Let us see what the principal ones are.

4. Resources
(1) Agricultural products

In northern and western China, the climate is arid and there are some extensive deserts. Here the principal products are meat, wool, and hides. South and east of this there is rainfall enough for agriculture. Here the products of the temperate zone, such as wheat, can be raised. What other grains and agricultural products have you found in the northern half of the United States? All these can be raised in this part of China.

Central China, just south of this section, has a warm, temperate climate. Here cotton, rice, millet, oranges, and silk are produced. Rice is one of the chief articles of food for the Chinese, and China produces more raw silk than any other country in the world.

The extreme southern part of the republic extends into the tropical zone. Here are found tropical fruits, such as grow in South America and the West Indies. Name several of them.

Thus China produces all the crops that the United States does, and more. Name some of their products that we do not raise.

The farming methods are very crude, but the Chinese are so skillful and industrious, that they till every bit of land possible (Fig. 366). For example, instead of leading water for irrigation only to land of gentle slope, as in the United States, they often take it to the very hilltops. It is first raised from the river by means of wheels, turned either by men or by buffaloes, and then pumped upward from one terrace to the next, until the whole hillside is watered. Such methods could not be used unless labor were very cheap. A Chinese laborer receives only about ten cents a day as wages.

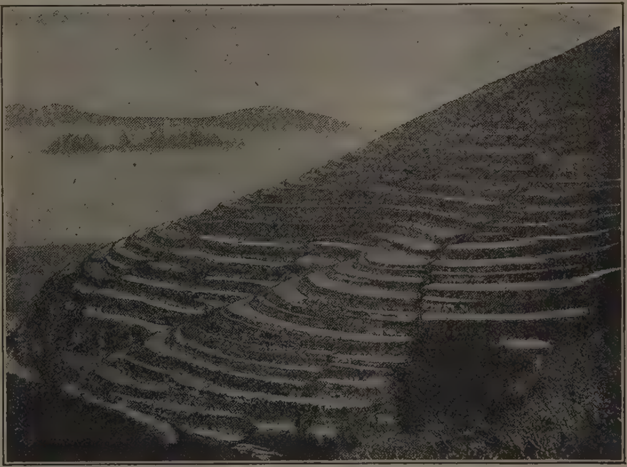


Fig. 366. — Chinese farm scenes. These terraces have been built by the Chinese, so that they can cultivate even the steep hill slopes.

(2) Fishing

There is valuable fishing along the coast. The Chinese make much use of fish as an article of food, catching them from the rivers as well as from the sea. They even train birds to catch fish for them.

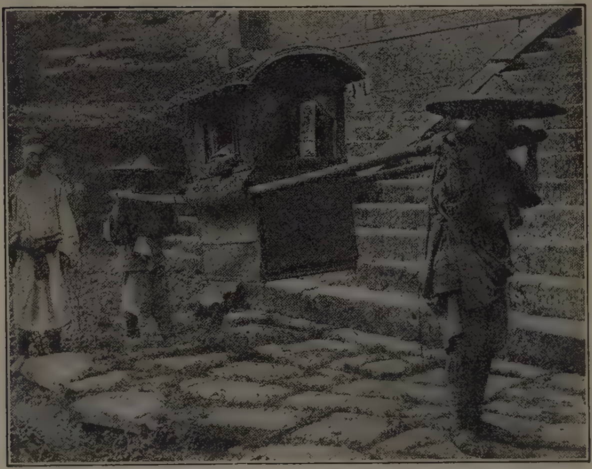


Fig. 367. — A Chinese lady being carried by two men — a very common way of traveling in China.

(3) *Minerals*

The Chinese have never been noted as miners, and therefore little is known about the mineral wealth of the country. Still it is certain that there are vast deposits of coal of the very best quality, some of it hard coal, like that of eastern Pennsylvania. There are also extensive deposits of iron, gold, silver, and other valuable minerals.

5. Manufacturing

The Chinese are an artistic people, and they make very beautiful chinaware and silk fabrics; but they still do most of the work by hand, as has been the custom for thousands of years.

They carry on other kinds of manufacturing, also, mainly by hand. There is, for instance, much use made of the bamboo, whose wood is used in building houses (Fig. 368), as well as in making nearly all articles of furniture. The bamboo is also woven into mats, baskets, and hats; and from its pulp paper is made; the seeds also are ground up for food, and the tender roots and stalks are eaten.

There are so many industrious, intelligent people in China, and there are such vast resources, that when China once adopts modern methods of manufacturing she will doubtless take a leading place among the nations of the world. It may happen, even, that China will be able to make and sell goods more cheaply than can be done in Europe or America.

6. Transportation

Means of transportation by water are abundant, since there are many canals and rivers. But the rivers often rise so rapidly and change their courses so greatly that they expose boats to much danger. The Hoang-ho, for instance, may rise so much as forty feet in a summer, and sometimes it becomes impossible to control it. In the last twenty-five hundred years it has changed its lower course eleven times, and has shifted the position of its mouth as much as three hundred miles. Some of the flood waters are led off into the canals, but not enough to avoid danger. On account of its repeated destruction of life and

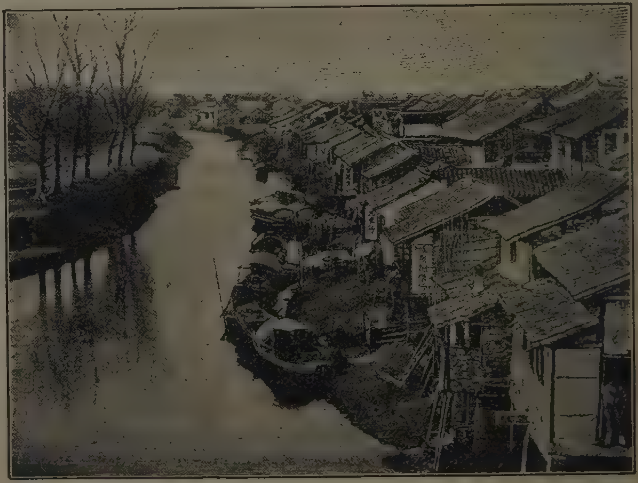


Fig. 368. — A Chinese village, with bamboo houses, on the banks of a canal.

property by floods, the Hoang-ho has been called "China's sorrow." Some of our own large rivers have caused danger in a similar way. Can you recall examples?

Wagon roads and railways need extensive development. But progress in these has already been well begun. The possibilities in regard to the roads are forcibly suggested by our own remarkable improvement of roads in the last ten years, largely through the influence of the automobile. It is interesting to know, too, that there are persons still living here who can recall the first attempt to build railways in the United States. One wonders how a country far more densely populated than our own can possibly get along without such conveniences at the present time.

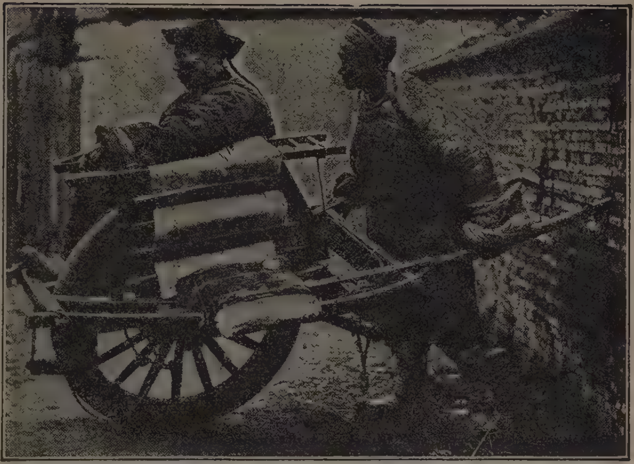


FIG. 369. — A Chinese passenger wheelbarrow, on which people are carried.

7. Change in government

The recent change in the government also gives much promise for the future. Until the year 1912 the form of government was a monarchy, the ruler being called emperor. The country was divided into provinces which corresponded somewhat to our states, and each of these provinces was under the direct control of a governor, or viceroy. The viceroy in each case collected taxes for the government but was in some important respects independent. This form of government was unsatisfactory; and it finally became so unpopular that the people rose in rebellion and established a republic. It is hoped now that with this more popular government great progress will take place. It makes little difference how large a country is, what its climate is, or how abundant its resources may be, if its government is too weak to preserve order and plan improvements. The more active interest that the Chinese people are now taking in their government is one of the most hopeful signs for their future.

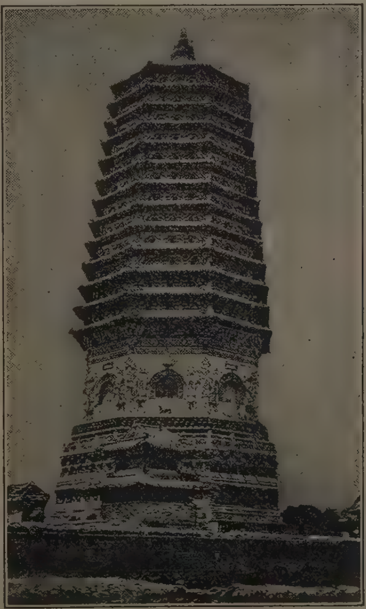


FIG. 370. — A Chinese pagoda, or temple, where the people worship.

Chief cities

You have already learned that a large part of the population of China lives along the coast and the lower courses of the rivers. There are so many people here that scores of thousands can find no room on the land, but live in house-boats on the water. Many others dig caves in the hillsides and live in them.

1. Canton and Hongkong

In this section there are many large cities. The largest is CANTON, which, situated on a densely populated delta, is a port of outlet for northern China. Canton is noted especially for silk.

HONGKONG, an island which commands the approach to Canton, belongs to the British. Many of the products of China are sent from this port to Europe and America.

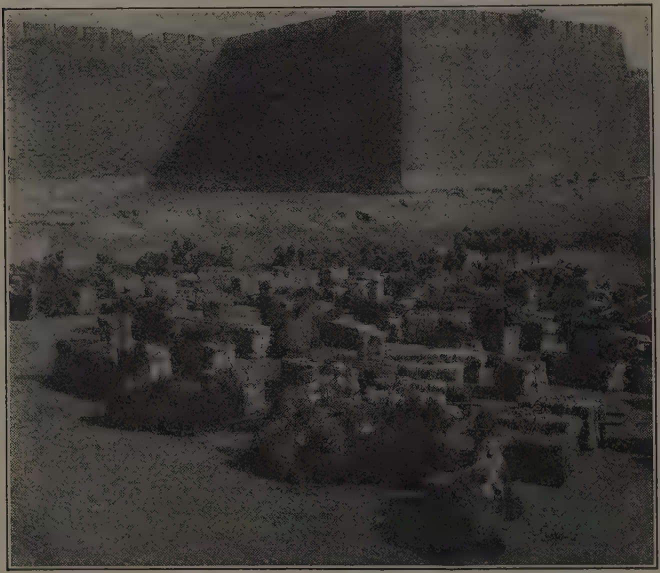


FIG. 371. — A caravan of camels, outside the walls of Peking.

2. Cities on the Yangtse-kiang River

HANKAU and WUCHANG, on the Yangtse-kiang River, are important river ports for tea. Here, as in the case of most Chinese cities, the number of inhabitants is uncertain. For example, by some estimates Hankau has a population of more than a million; by others only a half million.

SHANGHAI also is a large city. It is a *treaty port;* that is, one where foreigners are allowed by treaty to carry on trade. This is not permitted in all Chinese cities.

3. Peking and Tientsin

PEKING, the capital of China, was the capital of a kingdom for three thousand years, and the capital of the Chinese Empire for over eight centuries. This city, like others in China, is surrounded by a high wall (Fig. 371) with gates that are closed at night. Many European cities in olden times were so protected. One portion of the city, formerly reserved for the gardens and palaces of the emperor, is known as the "Forbidden City," because the Chinese government formerly refused to allow foreigners to enter it.

TIENTSIN, the port nearest PEKING, is an important seaport. It is situated at the northern end of the Grand Canal.

6. The Japanese Empire

Parts of the empire and importance of their location

The two principal islands of Japan are Nipon and Yezo; but the empire extends as far south as Formosa, which was captured from the Chinese in the war of 1894. On the north it includes the Kurile Islands, as well as the southern half of Sakhalin, which was ceded to Japan by Russia at the close of the war 1904–1905.

The position of this empire, a short distance from the mainland, has secured to the Japanese advantages similar to those that the British have enjoyed. That is, it has protected them from many invasions, and it has also given them a very favorable position for commerce. No part of the empire is far from the sea, so that shipment by water is easy. Estimate the greatest length of the empire from north to south. Is the fact that the islands are so scattered an advantage or a disadvantage, as compared with the British Isles?

Area and population

The combined area of the islands is almost a hundred and fifty thousand square miles. How does that compare with the area of the British Isles? Of New England? Of California? The population is more than fifty million. Thus the empire contains only a few million more than the British Isles. How does this compare with the population in New England? In California?

Recent advances

The Japanese have become noted for their ability to learn the lessons of western civilization; and their progress has been truly marvelous. New schools have been opened, education has been made compulsory, many newspapers have been established, and railways have been built. Americans and Europeans have been invited to Japan to teach, and Japanese students have been sent to Europe and America to study in the universities. Thus, in a single generation, the Japanese added to their own knowledge that of Europe and America. They have learned their lessons so well that, with their patience, skill, and intelligence, they alone, of all the nations in Asia, have taken rank with the Great Powers of the world.

Fig. 372.—Yoshihito, Emperor, or Mikado, of Japan.

Reasons for this wonderful advance

1. Eagerness to learn

Probably no nation has ever advanced more rapidly than has Japan during the last fifty years. Perhaps the most important of all reasons for this growth has been the eagerness of the people to learn. They have made an extensive study of western institutions and customs — the schools of Europe and America, the inventions and the methods of work — and have adapted to their own use whatever knowledge they thought profitable.

2. A good government

A second reason for the progress of the Japanese is their good government. Before 1853 the real power was in the hands of the noblemen, who had large numbers of peasants to work for them and to fight in their wars. This was somewhat like the condition in Europe in the Middle Ages, which was called the *feudal system.*

After Commodore Perry's visit a new government was established in which the people had a voice. There is an emperor, called the *Mikado* (Fig. 372), and a legislature with two houses, one elected by the people. The government is, therefore, a limited monarchy.

3. The natural resources of the country

The valuable resources of the country are a third reason for the advance of Japan. The climate is everywhere moist enough for agriculture, and the temperature is also favorable. In what zone does most of Japan lie? In what zone is the rest of the Empire? More than half of the surface is too mountainous for agriculture. One volcanic peak, called Fujiyama, has an altitude of 12,365 feet. It can be seen a great distance from the sea, and is noted for the beauty of its cone (Fig. 376). The mountainous region is largely wooded; but there is yet

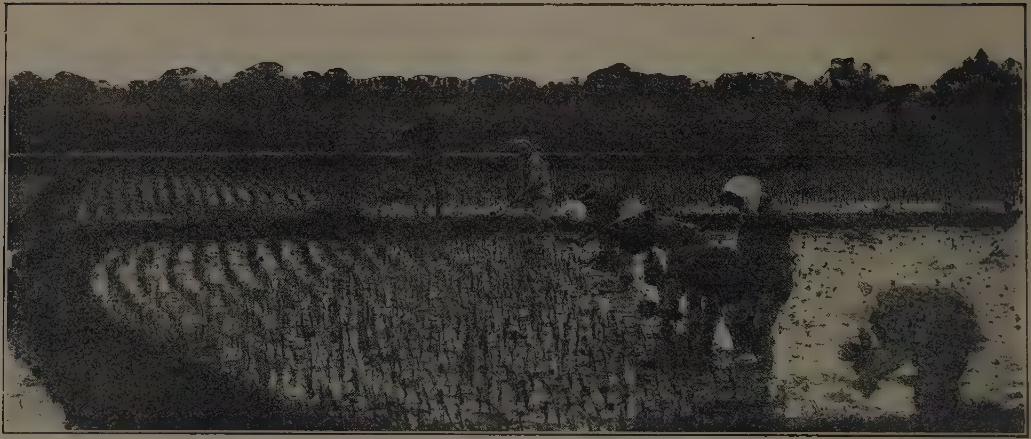


FIG. 373. — Planting rice in the flooded fields in Japan.

much excellent soil. The people have learned to cultivate it very skillfully, too, allowing no land to lie idle that can possibly be used for crops. About one sixth of the surface of the Empire is cultivated.

The long distance through which the lands extend from north to south makes it possible to raise many different kinds of crops. Measure to see how far it is from Yezo, on the north, to Formosa, on the south. What is the latitude of the northern and of the southern boundaries? The crops in the north are the products of the cool temperature zone; those in the south, and especially in Formosa, are such as are common to the tropical zone. Japan, like China, produces much tea, silk (Fig. 374), and rice (Fig. 373); and, as among the Mongolians, rice is one of the chief articles of food. Among other farm products are wheat, vegetables, fruits, and sugar.

There are also valuable forest trees, in-

FIG. 374. — Japanese women gathering the cocoons spun by the silkworm.

cluding the camphor, the laurel, and the lacquer trees, which grow in the forests that clothe the mountain sides.

Another resource of great value is the fish in the waters surrounding the Empire. Fully two and a half million Japanese are engaged in fishing, and fish forms one of the important foods of this island people.

This small country has important mineral resources, including gold, copper, iron, coal, and petroleum. There is also excellent water power for use in manufacturing.

4. Cheap and skillful labor

A fourth reason for the wonderful progress of Japan is that labor is very cheap there, as in China; and that the Japanese are very skillful workmen. In the United States one often sees especially beautiful fans, parasols, napkins, dolls, and screens that were made in Japan. Whatever the Japanese make, they try to make beautiful.

5. The growth of manufacturing

A fifth reason for the advance of the Japanese is the growth of manufacturing. They have learned methods of manufacturing from Europeans and Americans. Therefore, with their skill and industry, their cheap labor, and their abundance of raw materials, fuels, and water power, this industry has grown greatly. In silk manufacturing, especially, they have taken high rank. They are also very skillful in making pottery; and they manufacture much cotton and woolen cloth, as well as iron goods, including machinery and ships.

6. Advantages for commerce

A final reason for the rapid advance of Japan is its favorable situation for ocean commerce. In this respect it resembles the British Isles. The coast is very long, and there are many good harbors.

The islands are so narrow, and so mountainous, that there can be no large navigable rivers. But these are not greatly needed, for almost all parts of the Empire are near the sea and can therefore be reached by ocean vessels. Short railroad lines also extend into the interior and connect the seaports.

FIG. 375. — A Japanese coolie carrrying water.

One disadvantage

Japan suffers some serious drawbacks, however. For example, many of the islands are small, and all of them are mountainous. They are the crests of a great mountain range rising from the bottom of the sea, and some of the peaks are volcanoes (Fig. 376). The mountains are still rising, too, and as they rise, the rocks

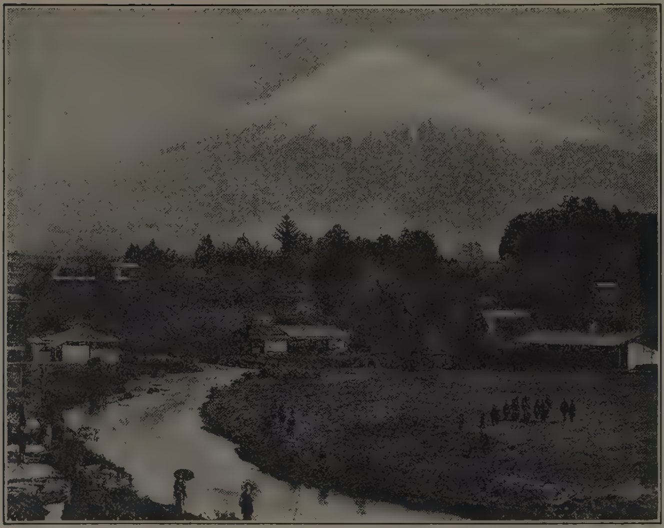


Fig. 376.—Fujiyama, a perfect volcanic cone in Japan.

now and then break apart and change their positions, causing earthquakes. Sometimes these shocks are so powerful that houses are thrown down, causing great destruction of life and property. Japan has been visited by many terrible earthquakes.

The great number of earthquakes has caused the Japanese to build low houses of light materials, such as bamboo, which withstand the shaking. Even if they are thrown down, they are not so dangerous to life as those made of stone or other heavy materials.

Principal cities

TOKYO, a city about as large as Chicago, is the capital of Japan. Besides being the home of the Mikado, and therefore having many government buildings, it is a busy manufacturing center. YOKOHAMA, at the entrance of Tokyo Bay, is the leading seaport of Japan.

The second city in size is OSAKA, noted for its cotton manufactures, and having a population of over a million. Other important cities are KYOTO, the former capital, and the center of the tea district, and NAGOYA, a center for porcelain manufacturing.

Korea

Japan gained control of Korea in 1905, as a result of the war with Russia. This mountainous peninsula has a temperate climate, suited to the production of such crops as grains in the north, and rice, tobacco, and cotton in the south.

In many respects the Koreans resemble the Chinese; in fact, Korea was for a long time a dependency of China. While there are great natural resources, including

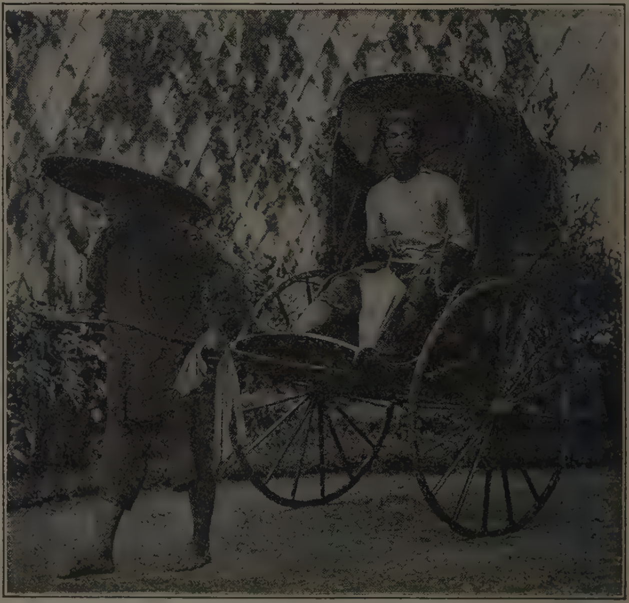


Fig. 377. — A Japanese laborer drawing a two-wheeled vehicle called a jinrikisha. A common way of going about the cities.

both coal and iron, little use has been made of them. Like the Chinese, the Koreans formerly forbade foreigners to enter their country. This is indicated by the name "Hermit Kingdom," long applied to Korea. But since the Japanese have obtained control of Korea, there has been much progress. The capital and the largest city is Seoul.

7. Indo-China and the Malay Peninsula

Surface and principal divisions

This peninsula is crossed from north to south by several mountain chains, with long, narrow valleys between. The flood plains and deltas of the rivers in these valleys are very fertile and are densely populated. Name the largest two of these rivers.

In addition to Burma, which is a part of the Indian Empire, there are three divisions of the peninsula: (1) *Siam,* (2) *French Indo China,* and (3) the British Colonies of *Straits Settlements and Malay States.* They are all tropical countries.

Siam

Most of the inhabitants of Siam live along the rivers and the irrigation canals. They are engaged chiefly in the cultivation of rice; but millet also, which is raised in the drier places, is much used for food. Among the mineral products are rubies, sapphires, gold, and tin. The forests yield valuable tropical woods.

Bangkok is the capital and the largest city. Here are the magnificent palaces of the king, and many Buddhist temples, decorated with gold and silver, and even with jewels. Next to the king, the white elephant is held in highest reverence, and Siam is often called "the Land of the White Elephant."

French Indo-China

French Indo-China resembles Siam in both climate and people. Its forest-covered hills yield valuable teak and iron wood, and in its valleys are extensive fields of rice and millet. Silk, cotton, tea, and spices are other products, and there are also extensive coal beds. Some coal is exported.

Straits Settlements and Malay States

The Straits Settlements and Malay States are the two names given to the British possessions on the southern end of the Malay Peninsula and some small islands near by. In that hot, damp country, so near the equator, such tropical products as rice, cocoanuts, rubber, and spices are obtained. There are extensive deposits of tin in this region, which supplies more than half the tin used in the world. The only city of importance is Singapore.

Fig. 378. — A family of Indian Brahmans of high caste.

8. The Indian Empire

India contains about one and three quarters millions of square miles. Compare that with the area of the United States, page 392.

Area and population

India is far more densely populated than the United States, having in fact, more inhabitants than North and South America together. In Fig. 354 note the distribution of population. What section is most densely settled?

Divisions of the empire

The Indian Empire includes not only the entire peninsula of India, but the desert country of *Baluchistan* on the west, and fertile *Burma* on the east. The two little countries of *Nepal* and *Bhutan*, among the Himalaya Mountains on the north, are to some extent under the protection of the Indian Empire.

Fig. 379. — An Indian woman of low caste.

Surface features

Most of the Indian Peninsula is a plateau one thousand to two thousand feet high. But on the northern border of the empire are lofty mountains, the highest being the Himalayas. In these mountains are many peaks that rise over four miles above sea level, and even the mountain passes are higher than Mont Blanc in the Alps. Between these lofty mountains and the Indian plateau is a broad lowland through which three great rivers flow, — the Ganges, the Indus, and the Brahmaputra. Trace each of these rivers.

The coast of India is very regular, and there are, therefore, few good harbors.

Climate

Having a tropical climate, India is a very hot country; and in some parts the climate is also very damp. This is true, for instance, in the southern part, and also in the north, on the slopes of the Himalaya Mountains. Here, just west of Burma, is the region which has the heaviest rainfall in the world. Much of the empire, however, suffers for want of rain. In northwestern India and in Baluchistan, for instance, there are extensive deserts; and much of the interior of the peninsula is arid. Thus, in many parts of India irrigation is necessary.

The people and government

The natives of India are classed as a branch of the white race, though most of them are much darker than Europeans. Before the British took control of India the peninsula was divided into many states ruled by native princes. Most of the states, too, have languages of their own.

The native states still exist, and the native princes still hold their places; but they are all under the general control of the British. The present form of government was established in 1858, and India was declared a part of the British Empire in 1876. Since that time the King of England has also been called the Emperor of India. An officer, called the *viceroy*, is sent to India from England to take general charge; but the natives have a share in their own government, and many of the government officers are native Hindus.

There are a number of religions in India, including the Christian, the Mohammedan,

Religion

and the Buddhist; but the religion of about three fourths of the people is Brahmanism. One of the teachings of their religion is the belief in *caste*, — that is, that a person born in one station in life must stay there and cannot hope to rise into a higher station. That is very different from our belief that all men are born free and equal.

The people of India have many religious superstitions. For example, the Ganges is considered a sacred river, and bathing in its waters is supposed to wash away disease. Since the waters are also used for drinking, this custom is no doubt responsible for much spread of disease. The devout Hindu makes at least one pilgrimage to the holy river as a means of gaining divine favor and forgiveness.

Why these possessions are valuable

India, together with the peninsula and islands east of it, is the part of the world that Columbus was seeking when he discovered America. He undertook this voyage in order to find a short and easy route for bringing to Europe the silks, dyewoods, spices, perfumes, ivory and precious stones that had long been reaching Europe from the Indies. These same valuable products are still brought from this region; but other products, as well, now come from here.

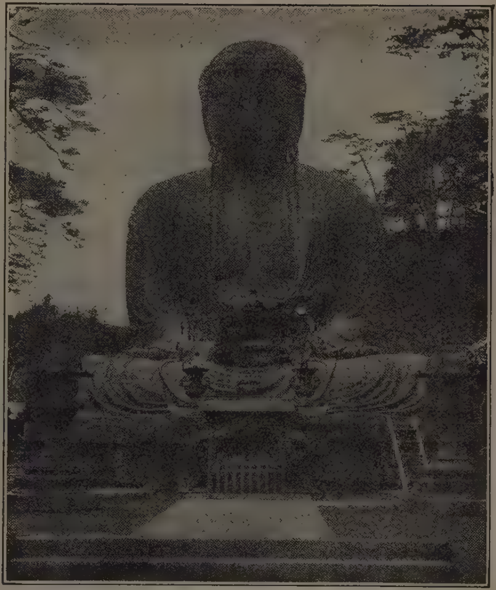


Fig. 380. — The great statue of Buddha.

1. Because of valuable forests products

There are extensive forests on the mountain slopes, from which much lumber is obtained. One valuable tree is the teak, whose strong, durable wood is useful in building ships. In the hotter portions are plants valuable for medicines; also spices, such as pepper and cinnamon. The bamboo is used in hundreds of ways in making implements and in building houses; and the palms supply juices for drink, cocoanuts (Fig. 385)

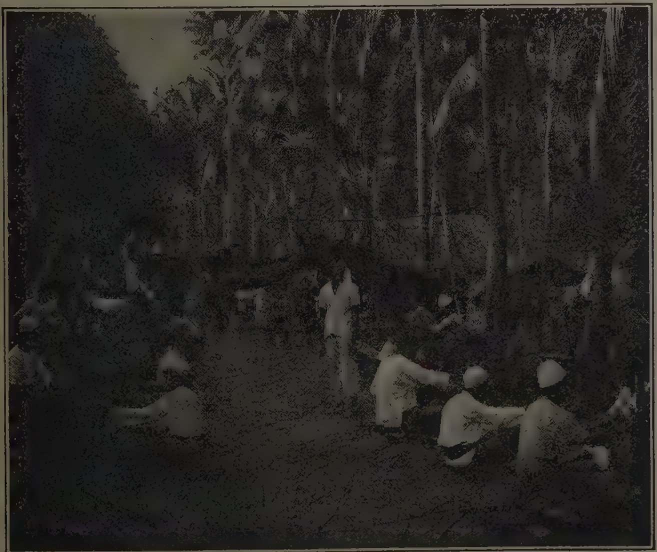


Fig. 381. — Natives preparing rattan in the tropical part of southern India.

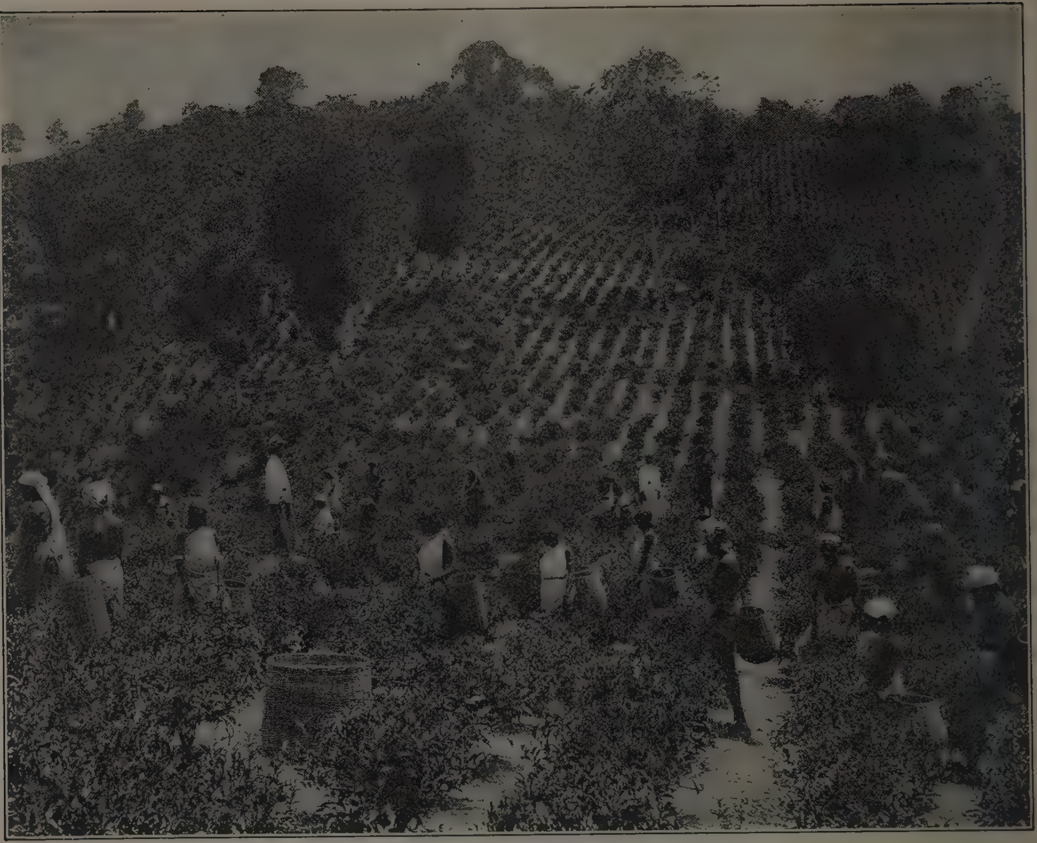


FIG. 382. — Natives picking tea in a tea plantation in India.

for food and for oil, and fiber for ropes and mats.

Eastern and southern India, where the winds blow from the ocean, have abundant rain. Because of the dampness and the tropical heat, there are extensive forests here, forming a dense tangle, or *jungle*. In this jungle the tiger lives; also the elephant (Fig. 385), and other large and fierce animals. There are great numbers of poisonous serpents, too, and thousands of people die every year from their bites. The English government has done much to make life safer and more agreeable in this section.

From the very earliest times the people of India have been engaged in farming, and at present fully three fifths of them follow that occupation. Millet and rice are the staple foods of the natives; but after the vast number of inhabitants are fed, there is little left for export.

2. Because of agricultural products

Wheat, on the other hand, is raised for export, and India is an important granary for Great Britain. Much cotton also is produced, and a part of this likewise goes to Great Britain. Other agricultural products are sugar cane, tobacco, opium, indigo, of value as a dye, and jute, which supplies a coarse, strong fiber. Much tea is raised on the hills of the very rainy region at the base of the Himalayas, south of Bhutan (Fig. 382).

Tea requires a hot climate, plenty of rain, and slope enough to prevent the water from standing around the roots of the plant. The tea plant, which is from two to four feet high, has bright green leaves similar to those of a rose bush. The leaves are picked several times a year, in many cases by boys and girls. After being picked, the leaves are dried in order to remove all moisture before packing.

3. Because of mineral products

India is not a great mining country, yet there are some valuable mineral deposits. Among these are salt, petroleum, iron, and coal. The latter is of special value because of its usefulness in manufacturing. Naturally coal is not much needed as a fuel in the homes. Why?

Benefits of English rule

The native inhabitants of India, like the Chinese, have long been highly civilized and have long been noted for their beautiful hand work in wood, metal, and cloth. They have many fine buildings that are centuries old. Even before the time of the Roman Empire, and of the Republic of Athens, the people of India were highly civilized. But, like the Chinese, for a long time they did not cultivate the arts and sciences as Europe has done. In many ways, therefore, it has been to their advantage to come under the control of the British.

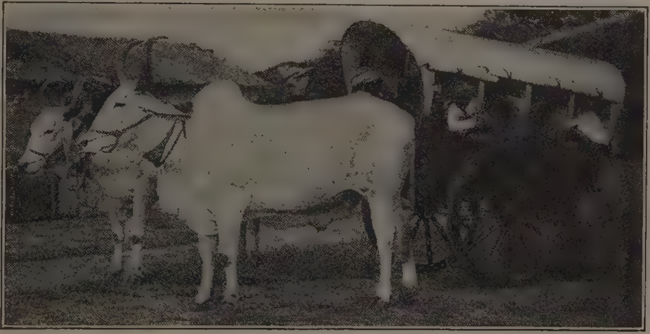


FIG. 383. — Native buffalo used for drawing wagons in India.

For instance, the British have caused many excellent roads and railways to be built in India. They have also established a number of manufacturing industries, especially cotton. Another important work has been the improvement of the system of irrigation; for much of western and central India is so arid that irrigation is necessary. Before the British took possession, famines and plagues were common. But the people are better fed now, and with the building of roads and railways, foods can be carried to places where the crops are an entire failure.

Reasons why the British control India

In spite of these benefits, one wonders how so large a country, with so vast a population, can be kept under control by the English. India is about twenty times as large as Great Britain and has about eight times as many inhabitants.

Many of the people of India are, in truth, dissatisfied with the English rule, and wish for independence; but they have not been able to obtain it, for India is very weak. The main cause for its weakness is the *caste* system, already mentioned. Men belonging to one caste will have almost nothing to do with those of a lower caste; they will not even eat at the same table with them. There are also different races, with varying customs, among the Indian people. These differences among them have made it impossible for the natives to expel the English, as they certainly could if they were united.

Large cities
1. Their number

So many Hindus are engaged in farming that only about five per cent of the population dwell in large towns. Yet, there are eighty-three cities, each with a population of more than fifty thousand, while one, Calcutta, has more than a million inhabitants, and two others, Bombay

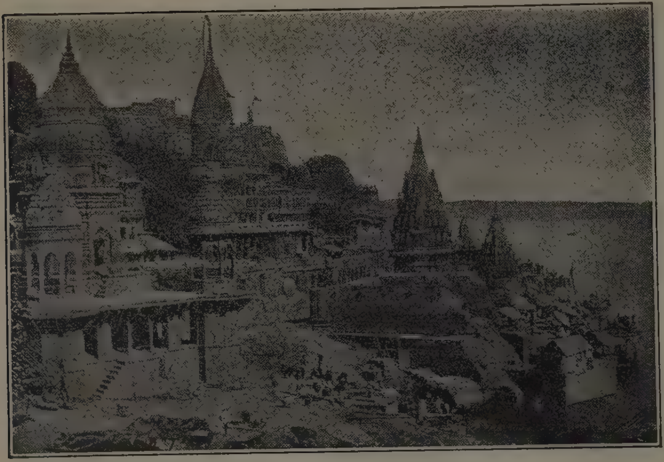


Fig. 384. — Temples on the banks of the Ganges at Benares.

and Madras, more than half a million each.

2. Cities on the Ganges River

Calcutta, a seaport on the Ganges delta, is the natural outlet of the fertile Ganges Valley. Since the city is situated near coal fields, there is some manufacturing; but Calcutta is chiefly important as a commercial center. In 1912 the seat of government was removed from Bombay to Delhi, which is now the capital.

Farther up the Ganges are two smaller cities, Lucknow and Benares. The latter, the "holy city of the Hindus," is on that part of the Ganges which is thought to be most holy. At this point temples (Fig. 384) line the banks of the river for miles, and a steady stream of pilgrims pours into and out of the city.

The Indus has no such large cities as those on the Ganges, partly because the country is desert, and partly because the river is too shallow for navigation.

3. Bombay and Madras

Bombay, next in size to Calcutta, and the nearest port to England, is a great business center. It is, moreover, the only Indian city with a good natural harbor. Madras, the third largest city, is situated at a point where there is only an open coast protected by a breakwater.

4. Rangoon and Mandalay

Rangoon, the seaport of Burma, is important for its export of rice; but Mandalay, farther up the Irawadi River, is the largest city.

Ceylon

Ceylon, with its fertile soil, abundant rainfall, and warm climate, is like a beautiful tropical garden. It was believed by the Arabs to be the Garden of Eden. Among the products are cocoanuts, rice, fruit, coffee, and tea. The island is the third most important tea-producing section in the world. Other products are sapphires, rubies, pearls, and mother of pearl.

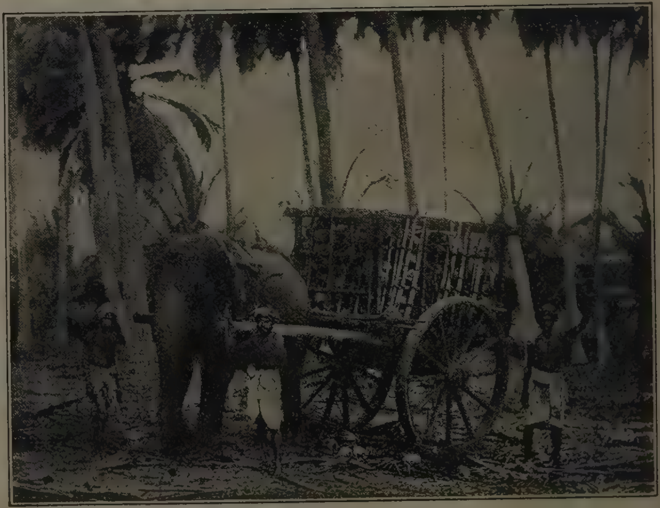


Fig. 385. — An elephant drawing a load of cocoanuts in Ceylon.

General facts about Asia

1. Questions

1. What can you say about the size and position of Asia? 2. In what directions do its mountain ranges extend? 3. Tell about its lowlands and highlands. 4. Its rivers. 5. Its climate. 6. The number and location of its people. 7. Our debt to them for plants and animals. 8. Give some reasons why they have fallen so far behind. 9. What is their prospect for progress?

2. Suggestions

1. Have you ever seen any Asiatic people? From what countries did they come? 2. By what water routes could you go from New York to Tientsin? Would it be nearer to go by rail as far as San Francisco or Seattle?

The Turkish, or Ottoman, Empire

1. Questions

1. Why is this empire of special interest to us? 2. Describe its surface and climate. 3. Tell about the surface and climate of the Holy Land. 4. What important events happened there?

2. Suggestions

1. What stories in the Bible have you read that tell about places mentioned in this geography? 2. Point out on the map (Fig. 356) some of the places often mentioned in the New Testament, and describe some of the events that occurred there. 3. What is the meaning of B.C. and A.D. after a date (for example, 800 B.C. or 1900 A.D.)?

Arabia, Persia, and Afghanistan

1. Questions

1. Describe the surface features and climate of Arabia. 2. How is Mecca of importance? 3. Describe the surface features and climate of Persia. 4. State facts about Afghanistan.

2. Suggestions

1. Find out how pearls are obtained. 2. What is mother of pearl?

Russia in Asia

1. Questions

1. State the important facts about the area and divisions of Russia in Asia. 2. What about the importance of this region in the past? 3. Why not more important? 4. Tell about recent improvements and the prospects of progress. 5. Name and locate the principal cities.

2. Suggestions

1. Of what advantage will the Siberian railway be to Russia? 2. How does that railway compare in length with those crossing the United States?

Republic of China

1. Questions

1. Tell about the early advance of the Chinese people. 2. The great wall that they built. 3. Their old fashioned customs. 4. State what facts you can about the area and population of China. 5. Its variety of climate. 6. Surface features. 7. Name its principal agricultural products. 8. What about its fishing? 9. Manufacturing? 10. Transportation? 11. Change in government?

2. Suggestions

1. How might railways in China help greatly to prevent the awful famines that they sometimes have there? 2. Why should the Great Wall have less value now than formerly? 3. What reasons can you see for or against the free admission of Chinese to the United States?

Japan

1. Questions

1. Locate and name the principal parts of the Empire. 2. Compare Japan with the British Isles. 3. Tell about the area and population. 4. Recent advances. 5. Give several reasons for these advances. 6. State one disadvantage. 7. Name and locate the principal cities. 8. Tell about Korea.

Indo-China and the Malay Peninsula

1. Questions

1. Describe the surface features of this region. 2. Name the principal divisions.

The Indian Empire

1. Questions

1. State some facts about the area and population of this region. 2. Name the chief divisions of the Indian Empire. 3. What can you say about the people and government? 4. Mention some ways in which this region is valuable to the British. 5. Mention some benefits that the native inhabitants have received from British rule. 6. Give special reason why the British are able to control India.

2. Suggestions

1. How far was Columbus from India when he discovered America? 2. What route would he have taken if he had continued his voyage to India? 3. Read Kipling's "Jungle Book."

Comparisons with North America

1. How do North America and Asia differ in form? In regularity of coast line? In direction of mountain ranges? In extent of the deserts? 2. Does the Canadian Pacific Railway lie north or south of the Siberian railway? Which road is the longer? 3. Is San Francisco north or south of Peking? 4. How do the great rivers of China compare in length with the Mississippi? 5. How do the interior lakes and seas of Asia compare in value for commerce with our Great Lakes? Why? 6. In what portions of North America and of Asia is rice cultivated?

II. AFRICA

Map study

1. Compare Africa with the other continents in size (Fig. 1). 2. Sketch the outline of Africa, and locate the principal rivers and lakes. 3. What peculiar fact do you notice about the location of the mountains? 4. What zones cross Africa? 5. What kind of climate should you expect to find (*a*) in the extreme north; (*b*) in the extreme south; (*c*) at the equator; (*d*) near the

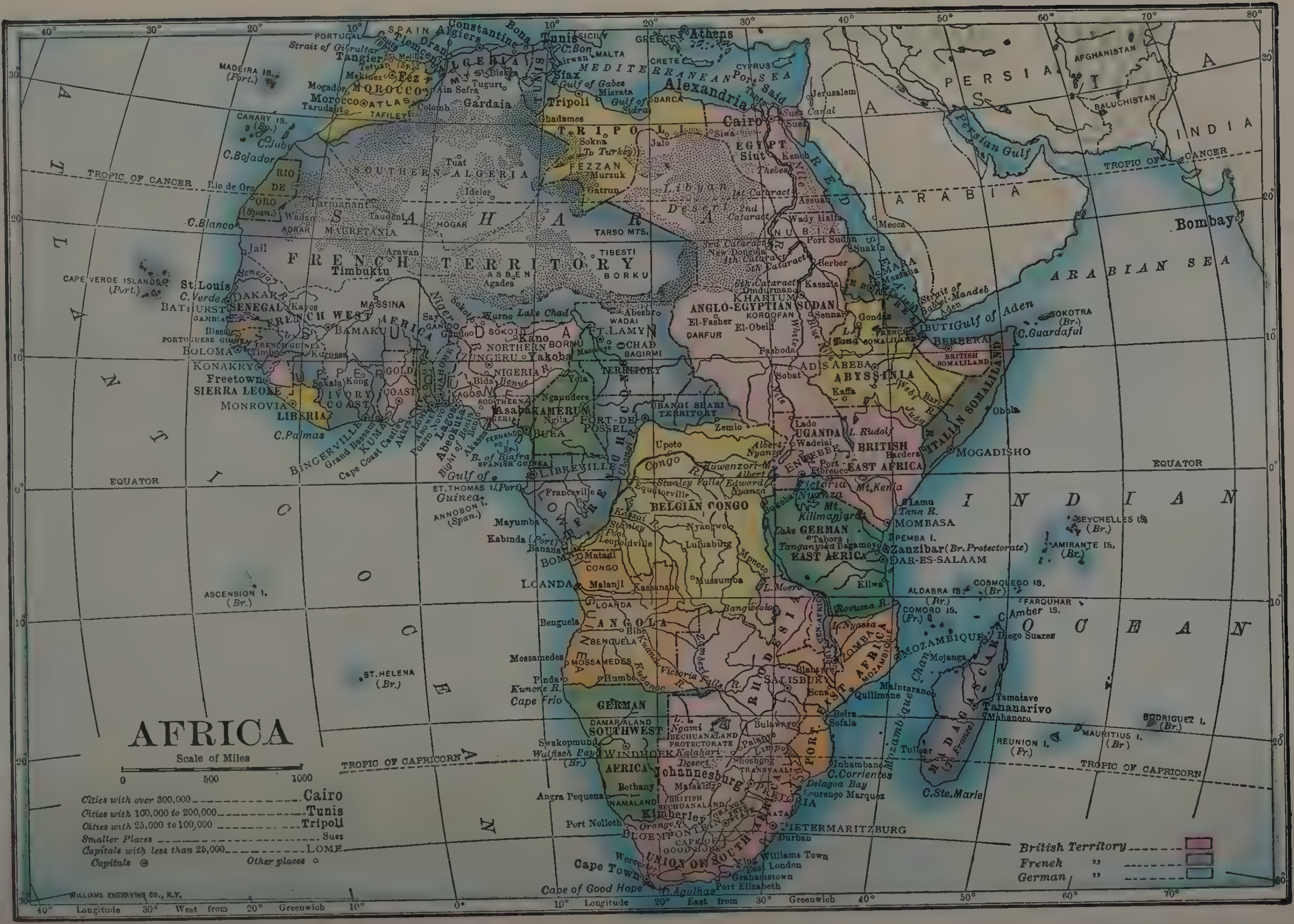

AFRICA
Scale of Miles
0
500
1000
Cities with over 300,000 Cairo
Cities with 100,000 to 200,000 Tunis
Cities with 25,000 to 100,000 Tripoli
Smaller Places Suez
Capitals with less than 25,000 LOME
Capitals ◎
Other places ○
British Territory
French "
German "
WILLIAMS ENGRAVING CO., N.Y.
Longitude West from Greenwich
Longitude East from Greenwich
TROPIC OF CANCER
EQUATOR
TROPIC OF CAPRICORN
ATLANTIC OCEAN
INDIAN OCEAN
MEDITERRANEAN SEA
RED SEA
ARABIAN SEA
ARABIA
PERSIA
AFGHANISTAN
BALUCHISTAN
INDIA
ASIA
Bombay
Persian Gulf
Mecca
Jerusalem
Gulf of Aden
Strait of Babel-Mandeb
Aden
SOKOTRA (Br.)
C.Guardaful
MADEIRA IS. (Port.)
CANARY IS. (Sp.)
CAPE VERDE ISLANDS (Port.)
ASCENSION I. (Br.)
ST.HELENA (Br.)
ST. THOMAS I. (Port.)
ANNOBON I. (Span.)
SEYCHELLES IS (Br.)
AMIRANTE IS. (Br.)
ALDABRA IS. (Br.)
COSMOLEDO IS. (Br.)
FARQUHAR IS.
COMORO IS. (Fr.)
REUNION I. (Fr.)
MAURITIUS I. (Br)
RODRIGUEZ I. (Br.)
PORTUGAL
SPAIN
Strait of Gibraltar
GREECE
Athens
SICILY
MALTA
CRETE
CYPRUS
Tangier
Tetuan
Melilla (Sp.)
Fez
Mekinez
MOROCCO
Morocco
Mogador
Tarudant
ATLAS
TAFILET
Colomb
Ain Sefra
Oran
Tlemcen
Algiers
Constantine
Bona
ALGERIA
Biskra
Tugurt
Gardaia
SOUTHERN ALGERIA
Tuat
Idelee
HOGAR
Tunis
C.Bon
Kairwan
TUNIS
Sfax
Gulf of Gabes
Tripoli
Misrata
Gulf of Sidra
BARCA
TRIPOLI
Ghadames
Sokna
(To Turkey)
FEZZAN
Murzuk
Gatrun
Jalo
Siwa
Libyan Desert
Alexandria
Port Said
Tanta
Cairo
Suez
Suez Canal
EGYPT
Siut
Keneh
Thebes
Assuan
Nile
1st Cataract
2nd Cataract
3rd Cataract
4th Cataract
5th Cataract
6th Cataract
Wady Halfa
NUBIA
Port Sudan
Suakin
New Dongola
Berber
Omdurman
KHARTUM
ANGLO-EGYPTIAN SUDAN
KORDOFAN
El-Fasher
El-Obeid
DARFUR
Kassala
Sennar
Fashoda
White Nile
Blue Nile
Sobat
ERITREA
Massaua
Gondar
L. Tana
FRENCH SOMALILAND
JIBUTI
BERBERA
BRITISH SOMALILAND
ITALIAN SOMALILAND
ADIS ABEBA
ABYSSINIA
Kaffa
Webi R.
Juba R.
Obbia
MOGADISHO
Bardera
BRITISH EAST AFRICA
L. Rudolf
Lado
UGANDA
Wadelai
Entebbe
Port Florence
Victoria Nyanza
Mt. Kenia
Mt. Kilimanjaro
Lamu
Tana R.
MOMBASA
PEMBA I.
Zanzibar (Br. Protectorate)
DAR-ES-SALAAM
Bagamoyo
Tabora
Tanganyika
GERMAN EAST AFRICA
Kilwa
Rovuma R.
L. Nyassa
NYASALAND
L. Moero
Bangweolo
Mozambique
MOZAMBIQUE
PORTUGUESE EAST AFRICA
Quillimane
Beira
Sofala
Inhambane
C.Corrientes
Delagoa Bay
Lourengo Marquez
Mozambique Chan.
MADAGASCAR (To France)
Diego Suarez
C.Amber
Mojanga
Maintarano
Tamatave
Tananarivo
Mahanoro
Tullear
C.Ste.Marie
RHODESIA
SALISBURY
Bulawayo
Zambezi R.
Victoria Falls
Limpopo R.
Shoshong
TRANSVAAL
PRETORIA
Johannesburg
Mafeking
ORANGE FREE STATE
BLOEMFONTEIN
Kimberley
Orange R.
NATAL
PIETERMARITZBURG
Durban
CAPE OF GOOD HOPE
UNION OF SOUTH AFRICA
King Williams Town
East London
Grahamstown
Port Elizabeth
Worcester
Cape Town
Cape of Good Hope
C.Agulhas
Port Nolloth
NAMALAND
BECHUANALAND PROTECTORATE
BRITISH BECHUANALAND
Kalahari Desert
L. Ngami
GERMAN SOUTHWEST AFRICA
DAMARALAND
WINDHOEK
Bethany
Swakopmund
Walfisch Bay (Br.)
Angra Pequena
Cape Frio
Kunene R.
Pinda
Mossamedes
MOSSAMEDES
Humbe
BENGUELA
Benguela
Bihe
Kuando R.
Kubango R.
ANGOLA
LOANDA
Malanji
Kassanshe
Mussumba
Lualaba
Nyangwe
Mpneto
Luluaburg
BELGIAN CONGO
CONGO
Congo R.
Kassai R.
Leopoldville
Matadi
BOMA
Banana
Kabinda (Port)
Mayumba
FRENCH CONGO
Franceville
LIBREVILLE
Stanley Pool
Stanley Falls
Equatorville
Upoto
Ubangi R.
Zemio
UBANGI SHARI TERRITORY
FORT-DE-POSSEL
Albert Nyanza
Edward Nyanza
Ruwenzori Mt.
SPANISH GUINEA
B. of Biafra
FERNANDO PO I. (Sp.)
Gulf of Guinea
Bight of Benin
KAMERUN
BUEA
Ngila
Ngaundere
Yola
Benue R.
Asaba
SOUTHERN NIGERIA
LAGOS
Lagos
Abeokuta
Porto Novo
Abomey
DAHOMEY
NORTHERN NIGERIA
ZUNGERU
Yakoba
Bida
Kano
SOKOTO
Sokoto
BORNU
Gando
Say
Wurno
Lake Chad
Abeshr
WADAI
FT.LAMY
CHAD
BAGIRMI
Massenya
CHAD TERRITORY
BORKU
TIBESTI
TARSO MTS.
ASBEN
Agades
FRENCH TERRITORY
SAHARA
Timbuktu
Arawan
Taudeni
Tarmanant
MAURETANIA
ADRAR
Wadan
RIO DE ORO (Span.)
Rio de Oro
C.Blanco
C.Bojador
C.Juby
Jail
St.Louis
C.Verde
DAKAR
SENEGAL
Senegal R.
Kayes
BATHURST
GAMBIA
Bissao
PORTUGUESE GUINEA
BOLOMA
Timbo
FRENCH GUINEA
KONAKRY
Freetown
SIERRA LEONE
MONROVIA
LIBERIA
C.Palmas
MASSINA
FRENCH WEST AFRICA
BAMAKU
Niger R.
Kurussa
UPPER SENEGAL
Kong
Sakala
IVORY COAST
GOLD COAST
BINGERVILLE
Grand Bassam
KUMASI
Cape Coast Castle
Akkra
TOGO
LOME
Akassa
Brass

FIG. 386.

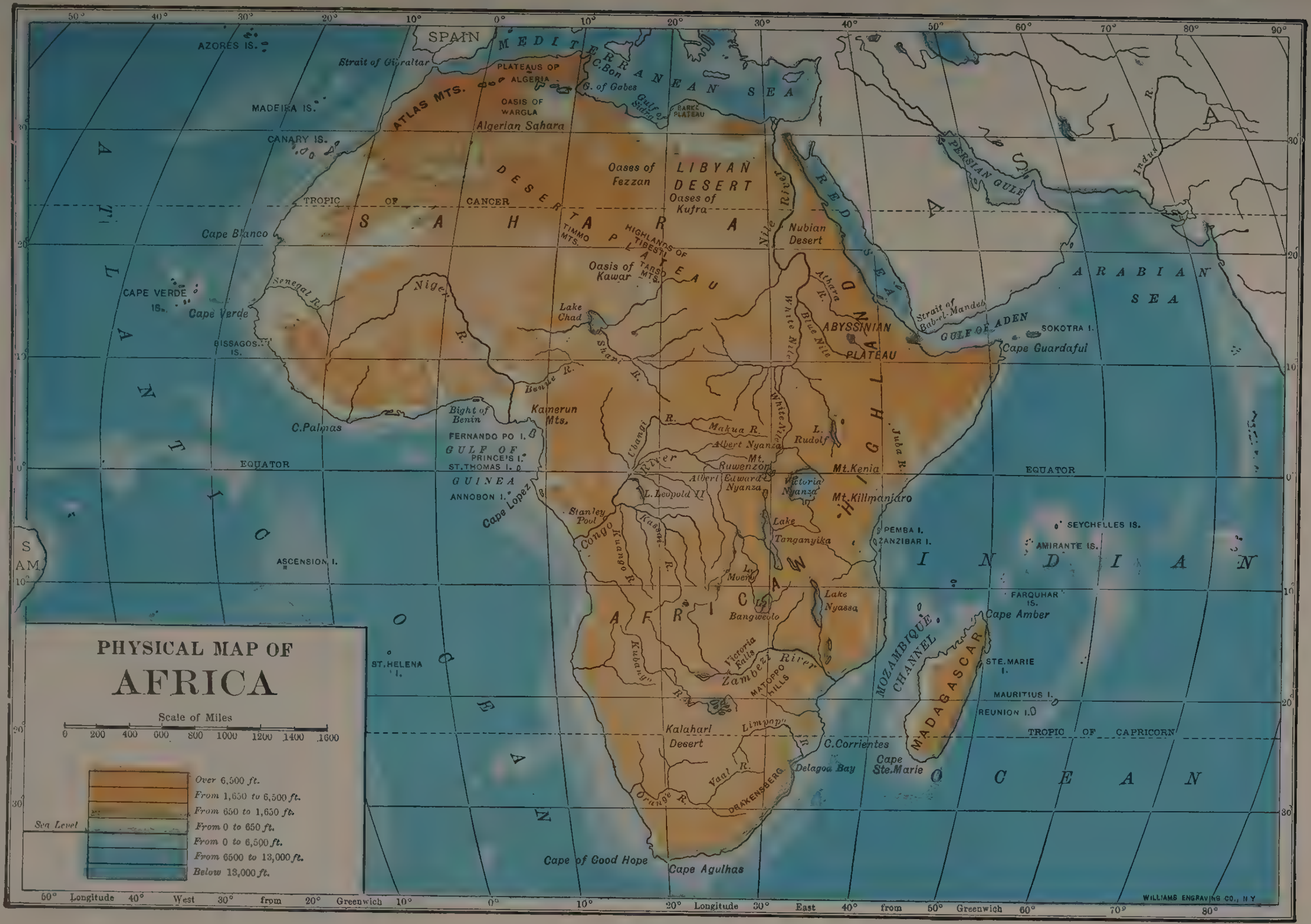

PHYSICAL MAP OF
AFRICA
Scale of Miles
0 200 400 600 800 1000 1200 1400 1600
Over 6,500 ft.
From 1,650 to 6,500 ft.
From 650 to 1,650 ft.
From 0 to 650 ft.
Sea Level
From 0 to 6,500 ft.
From 6500 to 13,000 ft.
Below 13,000 ft.
SPAIN
MEDITERRANEAN SEA
AZORES IS.
Strait of Gibraltar
MADEIRA IS.
CANARY IS.
ATLAS MTS.
PLATEAUS OF ALGERIA
OASIS OF WARGLA
Algerian Sahara
C.Bon
G. of Gabes
Gulf of Sidra
BARKA PLATEAU
Oases of Fezzan
LIBYAN DESERT
Oases of Kufra
DESERT
SAHARA
PLATEAU
TROPIC OF CANCER
TIMMO MTS.
HIGHLANDS OF TIBESTI
TARSO MTS.
Oasis of Kawar
Cape Blanco
Nile River
Nubian Desert
RED SEA
PERSIAN GULF
ASIA
Indus R.
ARABIAN SEA
Strait of Bab-el-Mandeb
GULF OF ADEN
SOKOTRA I.
Cape Guardaful
Athara R.
Blue Nile
White Nile
ABYSSINIAN PLATEAU
HIGHLAND
Senegal R.
Niger R.
CAPE VERDE IS.
Cape Verde
BISSAGOS IS.
Lake Chad
Shari R.
Benue R.
Kamerun Mts.
Bight of Benin
C.Palmas
FERNANDO PO I.
GULF OF GUINEA
PRINCE'S I.
ST.THOMAS I.
ANNOBON I.
Cape Lopez
EQUATOR
Ubangi
Makua R.
Albert Nyanza
Mt. Ruwenzori
Albert Edward Nyanza
L. Rudolf
Victoria Nyanza
Mt.Kenia
Mt.Kilimanjaro
Juba R.
Congo River
L. Leopold II
Stanley Pool
Kuango R.
Kassai R.
Lake Tanganyika
L. Moero
L. Bangweolo
Lake Nyassa
AFRICA
PEMBA I.
ZANZIBAR I.
SEYCHELLES IS.
AMIRANTE IS.
INDIAN OCEAN
FARQUHAR IS.
Cape Amber
MOZAMBIQUE CHANNEL
MADAGASCAR
STE.MARIE I.
MAURITIUS I.
REUNION I.
TROPIC OF CAPRICORN
Kubango
Victoria Falls
Zambezi River
MATOPPO HILLS
Limpopo R.
Kalahari Desert
C.Corrientes
Delagoa Bay
Cape Ste.Marie
Vaal R.
Orange R.
DRAKENSBERG
Cape of Good Hope
Cape Agulhas
ATLANTIC OCEAN
ASCENSION I.
ST.HELENA I.
S. AM.
Longitude West from Greenwich
Longitude East from Greenwich
WILLIAMS ENGRAVING CO., N.Y.

FIG. 387.

tropics? 6. Find the desert country north and south of the equator (Fig. 387). 7. In what sections are most railways found? What reasons can you suggest for their location? 8. Where are the large cities? Compare their number with those in other continents.

I. General Facts

Surface features

1. Shape of the continent

Africa, the second continent in size, resembles South America in outline. Its form is roughly that of a triangle, broad at the north and tapering toward the south. The coast line is very regular, in this respect being quite different from the coast of Europe, Asia, and North America, but resembling that of South America and Australia. What effect must such a regular

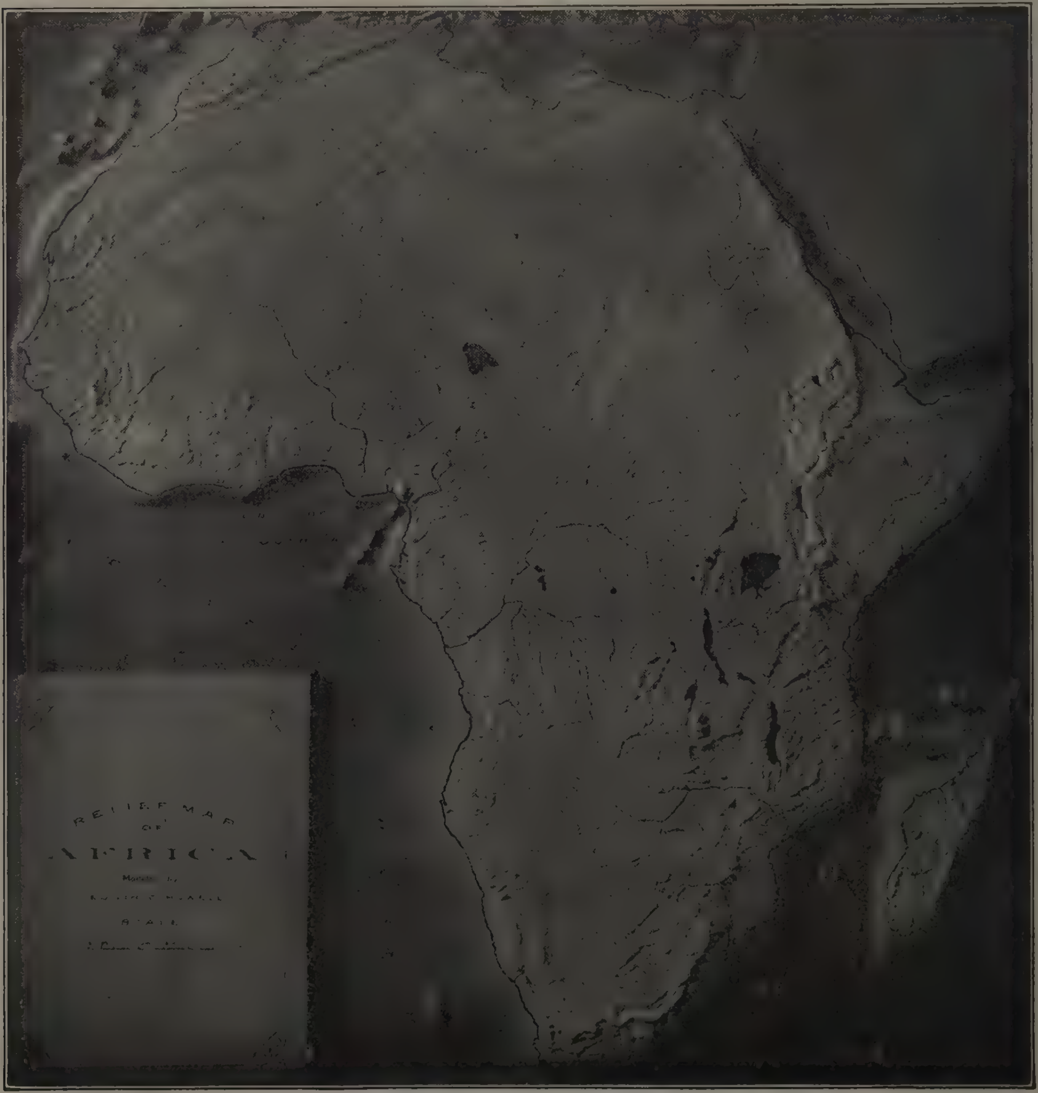


FIG. 388. — Relief map of Africa.

coast have on the number of harbors? What gulfs, seas, and large islands are found on the map of Africa?

2. The mountains and plateaus

Africa differs from all other continents in its mountain systems. The continent is mainly a plateau; but near the coast the plateau edges are broken, and the rocks uplifted, so that there is an almost complete mountain rim (Fig. 389). Trace the mountain rim (Fig. 388); from what part of the coast is it absent? In northern Africa some of the peaks of the Atlas ranges rise to a height of fourteen thousand feet; but the loftiest mountains are in the east-central part. Among the latter is the volcanic cone of Kilimanjaro. Find this peak and trace the mountains from there northward. Notice the elevated land in Abyssinia.

3. The drainage

Owing to the mountain rim, the rivers of Africa are peculiar. For instance, the Niger, after rising among the highlands near the west coast, sweeps around in a great curve before entering the Atlantic. The Zambezi, in the south, also rises near the west coast, but flows eastward across the continent to the Indian Ocean. Trace the courses of the Nile and the Congo, the two largest rivers.

In descending from the interior plateau each of these streams is interrupted by rapids and falls. Find the Victoria Falls of the Zambezi (Fig. 387); the cataracts of the Nile; also Leopoldville on the Congo, below which are some falls. How must these great rivers compare, therefore, with the Mississippi or Amazon as routes for commerce? How must these falls affect the development of Africa?

4. The lakes

In one part of Africa there are several large lakes. Name the three largest. Into what rivers do they empty? How do they compare in size with our Great Lakes (Appendix, p. 397)? Why are they not so useful for navigation and commerce?

Climate

1. Its general character

The equator crosses so near the middle of Africa that only the northern and southern extremities are in the temperate zones. Therefore the climate of most of the continent, like that of South America, is tropical. Since the African plateau rises to nearly the same elevation in all parts, the belts of climate extend nearly east and west. Is this true of South America?

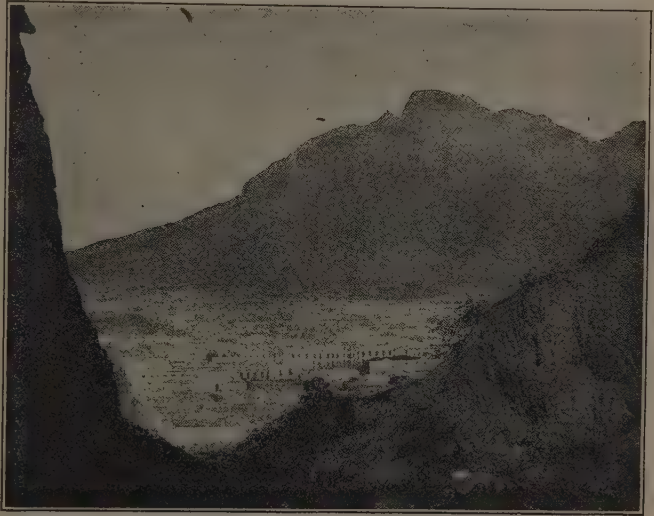


Fig. 389. — The mountainous rim of the African plateau at Cape Town.

2. The forest belt

For some distance both to the north and south of the equator, there is such a hot, rainy climate that, as in the Amazon Valley, the land is covered with a dense tropical forest. This is especially true near the coast at the base of the plateau, where the narrow strip of coastal plain is hot, reeking with moisture, and is therefore the seat of deadly malaria.

The interior, owing to its greater elevation, is cooler and more healthful; but even there tropical heat and rain prevail near the equator. It is this heavy rainfall that supplies the Congo and Nile with their immense volumes of water.

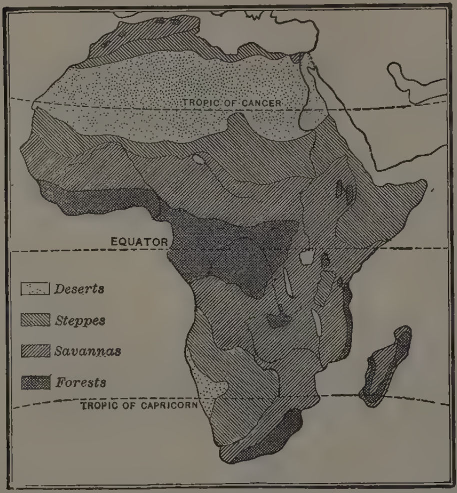


FIG. 390. — To show the influence of climate on vegetation. In the savanna area there are numerous forest-covered sections, especially near the rivers.

3. The savannas north and south of this belt

Both north and south of the rainy region is the savanna belt (Fig. 390), where the rainfall varies with the season. Why? Where are the corresponding savannas in South America? Why are the savanna belts covered with grass instead of forests?

4. The two desert regions

(1) Their location

As the tropical forest grades into the savanna, so the savanna merges into the true desert, where the influence of the drying trade winds is felt at *all* times of the year. In only a few parts of northern and southern Africa is there a fair amount of rain; that is, on the mountain slopes near the Mediterranean (Fig. 232) and on the southeastern slopes of South Africa, where the winds blow from the sea.

(2) Why the northern desert is much the larger

The northern desert is much larger than that south of the equator. This is due partly to the fact that the continent is so broad in the north, and partly to the large land areas which lie to the north and east. Since the north and east are the directions from which the winds of northern Africa must come, they reach this region with little vapor. Thus the Sahara forms a part of the most extensive desert belt in the world.

The native plant and animal life

1. In the savannas and the forest belt

The open country between the desert and the tropical forest abounds in large animals. Among these, on the savannas, and on the edge of the forest, are the antelope, giraffe, buffalo, zebra, elephant, lion, leopard, and rhinoceros, while the crocodile and the huge hippopotamus live in the rivers. The dense forest itself is shunned by many of the larger animals, though teeming with insect life, birds, reptiles, and tree-dwelling mammals. Among the latter are the baboon, the gorilla, and the chimpanzee.

2. In the desert regions

Portions of the desert, especially where covered with dunes of moving sand, have almost no plant life. Animals are also few in number, among them being the ostrich and the camel. The oases, on the other hand, support a number of plants. Of these the date palm is the most notable, for it is an important source of food for the nomads of the desert.

Native inhabitants of Africa

1. Negroes

Central and southern Africa is the home of the negroes, who are divided into many tribes with different customs. For centuries the negroes were captured by the whites and sold into slavery; but the day of the slave trade is now almost past.

In spite of the frequent slave-hunting raids, and the great destruction of life in the fierce tribal wars, there are many negroes left. Some are fierce and warlike; others peaceful. Those who dwell in the forest live by hunting; those upon the savannas, by simple forms of agriculture and by herding. With a fertile soil, and in a warm climate, they are able to support themselves with little work, especially along the rivers and on the savannas.

2. Whites

The forest and much of the savanna have been occupied by the negro, even down to the present day; but the arid sections of northern Africa have been held by the white race since very early times. They are in part herders living the nomadic life common to such lands. These people are intelligent and full of energy, though fierce and warlike. On the oases are a more peaceful class, living the life of farmers. Near the border line between the blacks and whites there has been such a mixture of blood that the population consists largely of half-breeds.

Exploration and settlement

1. Why so little of either

Although Africa is so near Europe, it has been less explored and settled by Europeans than any other continent. There are several reasons for this, the most important being the fact that so much of Africa has a tropical climate. The desert repels people, and the hot, damp climate of the coastal strip, upon which colonies would naturally be first started, was found to be very unhealthful. Disease is apt to seize white men even while they are crossing the coastal strip. Besides, progress into the interior was checked by hostile hordes of blacks, and by the absence of navigable rivers. Moreover, men who were willing to leave Europe were more attracted toward Australia and America. Why?

2. Exploration and settlements by the Portuguese

Even before the famous voyage of Columbus, the Portuguese — the most progressive sailors of that day — were trying to reach the East Indies by sailing around the southern end of Africa. After various voyages, the Cape of Good Hope was finally passed, and in 1498 the way to the Indies by water was opened. The Portuguese made settlements on the east and west coasts of Africa, and they still have large colonies there (Fig. 386).

3. By the Dutch

By far the most successful colony in the newly discovered parts of Africa was that started by the Dutch at Cape Colony, a little later than their settlement of New York. As was the case in New York, the British seized the Dutch territory; but by migrating northward, the Dutch were able to remain independent for a long time. Finally, in 1900, that territory also was seized by the British, who still hold it.

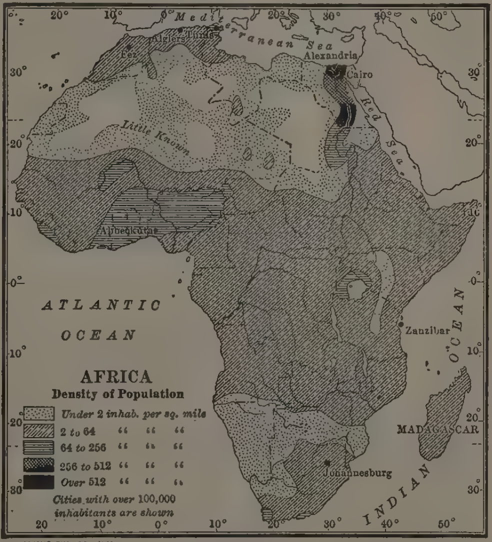


Fig. 391.

4. By other people

During the nineteenth century, Livingstone, Stanley, and other explorers entered the "dark continent"; and since these expeditions there has been great progress in exploring Africa. Many European nations have taken part in the exploration, and as a result have laid claim to the territory. Among these the British have been by far the most active. What other nations have possessions in Africa (Fig. 386)?

2. Northern Africa

Divisions of this region, and their government

Much of northern Africa is such a desert that its inhabitants are few and scattered. It is, however, under the control of several nations. The greater part of the Sahara is claimed by the French, though the Spanish hold a small section on the western coast, and the British control both the Libyan desert and the Egyptian Sudan in the east.

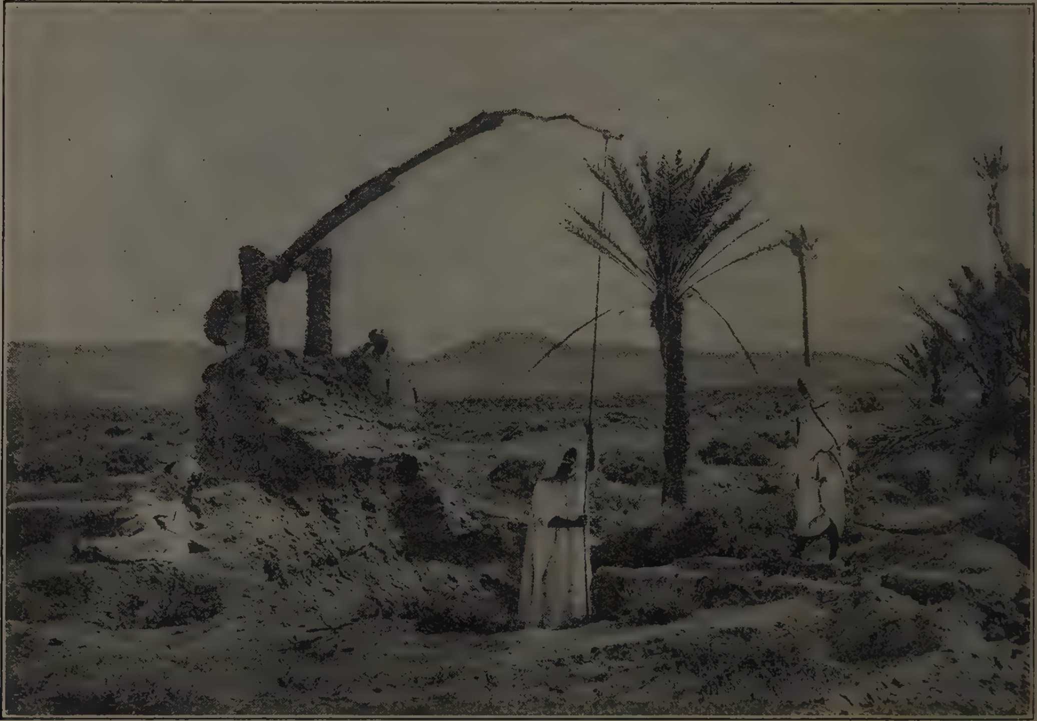


Fig. 392. — Algerian natives drawing water from a well on the edge of an oasis in the Sahara desert.

Along the Mediterranean coast are several well-settled sections, the best known being Egypt. The four countries west of Egypt — Tripoli, Tunis, Algeria, and Morocco — are often called the *Barbary States* (the home of the Berbers). Tripoli and Egypt are parts of the Turkish Empire, although the latter is partly under the control of the English; Algeria and Tunis belong to France; and Morocco is independent. It is ruled by an absolute monarch, called the Sultan.

The Sahara

1. Its extent

From the Atlantic to the Red Sea, and from near the Mediterranean coast to the grass lands of the Sudan, there is almost unbroken desert — the famous Sahara. Its area is estimated to be from three to four million square miles, or about equal to that of the entire United States.

2. Its surface features

It is a plateau of uneven surface, with low mountain ranges here and there, and bordered on the north by the Atlas Mountains. The wind-swept highlands are bare and stony, while in the lowlands there are extensive areas of sand dunes. Much of the soil is fertile, and with rainfall would yield abundant crops. But nature has forbidden rain, and its surface is therefore barren in the extreme. Only on the oases, of which there are some four hundred in the Sahara, is there water for irrigation and for drinking (Fig. 392).

Fig. 393. — One of the Pyramids.

Caravans cross this desert in order to carry the products of central Africa to the northern coast. These include ivory, skins, and ostrich feathers, obtained by bartering with the negroes.

Egypt and neighboring British territory

1. Its climate

Egypt and the Libyan desert are a continuation of the Sahara and have all the features of the desert just described. Even at Cairo the average yearly rainfall is but an inch and a half. The climate of northern Egypt, both in summer and winter, closely resembles that of the desert portion of western Arizona and southeastern California.

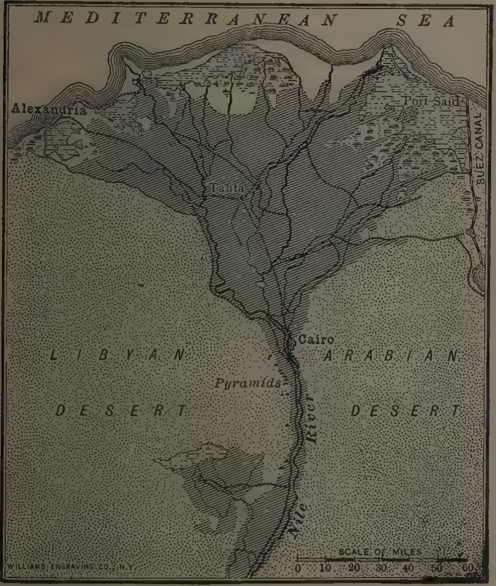


Fig. 394. — The lower Nile. The shaded area between the two deserts is farming land, which is reached by water from the river. The numerous crossed lines are railways. Find the Pyramids. Why is the location at the head of a fertile delta, and at the outlet of a narrow river valley bounded by desert, a favorable one for a large city?

2. The Nile River

(1) ***Where its waters come from***

The Egyptian Sudan and the country south of it, on the other hand, have a tropical climate, arid in the north, but warm and humid in the south, where the influence of the tropical rains is felt. The head waters of the Nile, near the equator, are fed by such heavy rains that the river is able to flow across the desert in spite of the fact that no tributaries enter the lower half of its course. How great a distance is that?

(2) ***Its character***

After leaving the rainy region of the south, the Nile crosses the desert through a valley — in places a thousand feet deep — which it has cut in the plateau. In this part of its course there are several cataracts (Fig. 386).

Below Cairo the river leaves its narrow valley, divides into several channels, and flows across a plain (Fig. 394). This plain is the *delta* which the Nile has built in the Mediterranean Sea during the ages that the

FIG. 395. — The Sphinx in the Egyptian desert.

river has been bringing sediment from its upper course. It is the Nile that suggested the term *delta,* now given to similar deposits at the mouths of rivers in various parts of the world. The word comes from the Greek letter delta (Δ), which has the form of a triangle. Notice that shape in Figure 394.

(3) *Its importance*

When the rainy season swells the Nile tributaries among the Abyssinian Mountains, the river rises so high that it overflows large tracts of the broad delta below Cairo. The rise begins in June and reaches its height in October. By this overflow the land is irrigated, and a thin layer of fine mud is spread over the fields. This serves to fertilize the soil so that, year after year, heavy crops may be raised without making the soil sterile.

Without the Nile the whole of northern Egypt would be a sparsely inhabited desert; but the precious river waters transform the section near the Mediterranean into a great oasis. This has become the seat of an important agricultural industry, and is densely settled.

3. Agriculture

Because of these very favorable conditions, the Nile delta has been occupied by an agricultural people from the very earliest times. It is still the seat of a great grain industry, producing wheat, corn, millet, and barley. Much rice and sugar cane are also raised, and much cotton, which is of especial value because of its long fiber. There are many vineyards, and orange, lemon, and fig groves; and both along the Nile and on the oases of the desert there are groves of date palms. Grazing is important in the Nile Valley and on the neighboring plateau. The animals raised include the buffalo and camel, in addition to sheep, goats, cattle, horses, and donkeys.

4. The Suez Canal

Northeastern Egypt includes the Isthmus of Suez, which connects Africa with Asia. This narrow neck of land has for centuries stood as a barrier to water travel from Europe to southeastern Asia, forcing European vessels to pass all the way around Africa in order to reach southern Asia. It is not to be wondered at, therefore, that a ship canal has been dug across this isthmus.

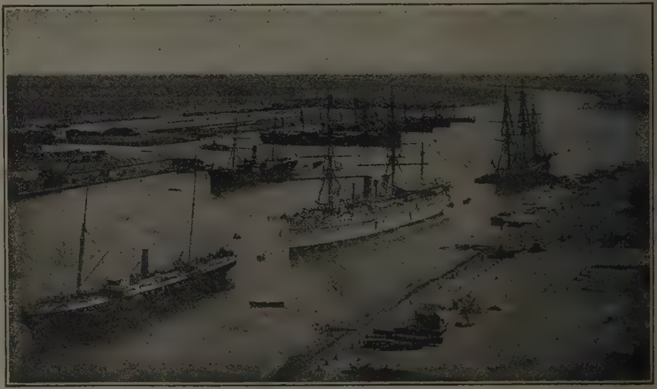


FIG. 396. — Ships passing through the Suez Canal.

The Suez Canal, begun in 1859, was finished in 1869. It extends from SUEZ to PORT SAID (Fig. 396), and is eighty-seven miles long, with a depth of twenty-six feet and a width at the surface of from sixty-five to one hundred and twenty yards. Its length is much greater than that of the Panama Canal, but it was easier to dig, for the country is quite level, and about twenty-one miles of the canal is through a lake. Ten vessels, on an average, pass through the Suez Canal each day. Estimate the distance saved by this canal in going from London to Calcutta.

5. Leading cities

At the head of the delta, just above the point where the Nile branches (Fig. 394), is CAIRO, the capital and largest city of Egypt, and, in fact, of all Africa. It has a population of over half a million. This interesting place is visited each year by a stream of tourists, some attracted by its reputation as a winter health resort, others by the strange life of the country and by the remarkable ruins of the ancient civilization (Figs. 393 and 395).

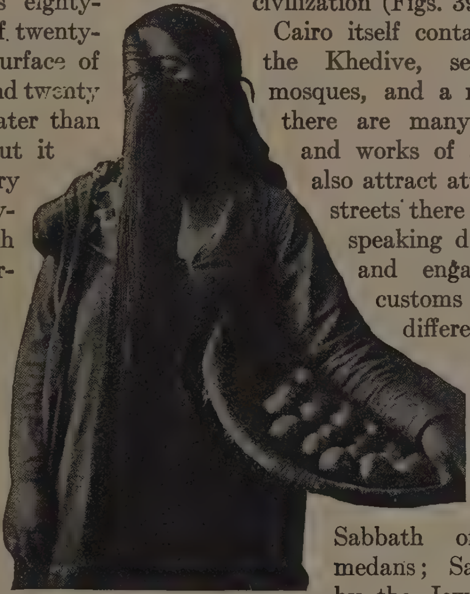


FIG. 397. — An Arab woman in the streets of Cairo.

Cairo itself contains the palace of the Khedive, several interesting mosques, and a museum in which there are many Egyptian relics and works of art. The natives also attract attention, for in the streets there are many people, speaking different languages and engaged in peculiar customs (Fig. 397). The differences among the people are indicated by the following fact: There are three Sabbaths each week, Friday, the Sabbath of the Mohammedans; Saturday, observed by the Jews; and Sunday, by the Christians.

ALEXANDRIA, connected with Cairo by rail, is the seaport of Egypt and the second city in size. Nearly half the trade is with Great Britain.

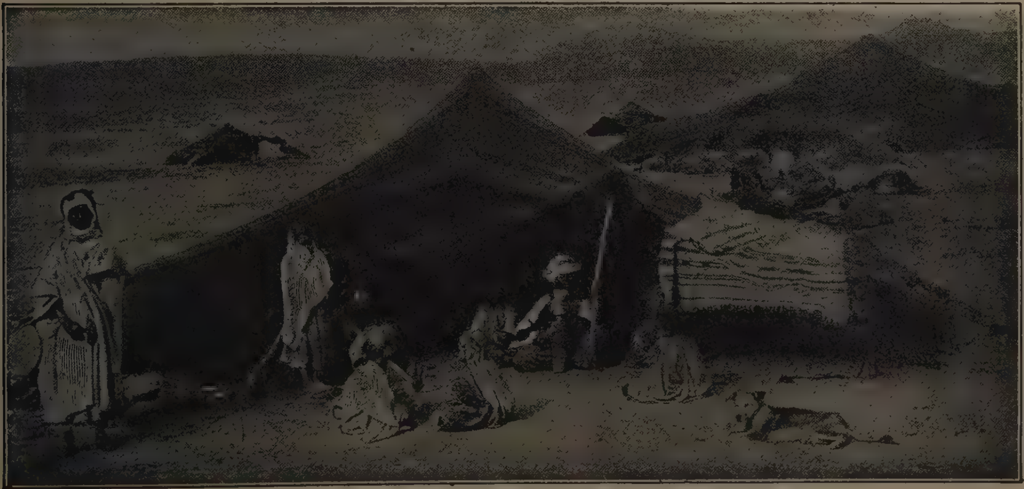


FIG. 398. — Nomads encamped in the desert of Algeria, south of Biskra.

The Barbary States

1. Their surface and climate

State the position of each of the four countries west of Egypt. While these countries border the Mediterranean, they extend far southward into the desert. What about the government of each?

The Atlas Mountains skirt the Mediterranean coast from the Atlantic to Tunis, where they project into the Mediterranean, forming the most northerly point in Africa. These mountains cause vapor to be condensed when winds blow from the ocean or from the Mediterranean. For this reason many of the valleys among the mountains are well watered.

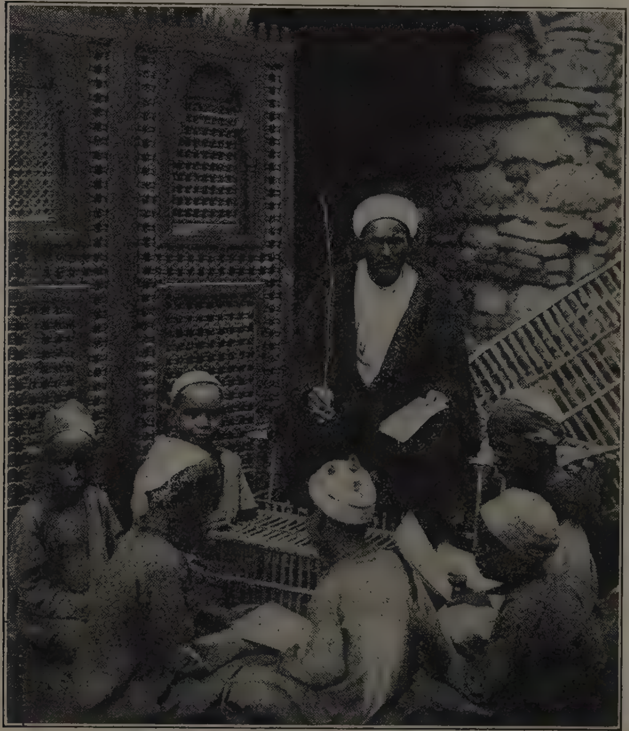


FIG. 399. — An Arab school in northern Africa.

2. Their products

Forests cover some of the mountain slopes, and one of the valuable trees is the cork oak. Large numbers of camels, sheep, goats, and cattle are raised among the mountains and upon the plateaus.

Agriculture is carried on here and there, often by means of irrigation, with water supplied by the mountain snows and rains, as in Southern California. Among the crops are dates, grains, figs, grapes, and olives. Wine from the grapes of Algeria is shipped in large quantities to France; and much olive oil and the best dates in the world come from Tunis.

The mountains contain many valuable mineral products, including precious metals in Morocco and Algeria, and marble and alabaster in the latter country. Little use is made of these minerals, however.

3. Character of the inhabitants

The original occupants of this region, the *Berbers*, still dwell on the desert and among the mountains, where they were driven long ago by invading Arabs. Most of the natives are Mohammedans. Many of the inhabitants are still barbarous, and some of the tribes in the mountainous sections do not recognize any government.

4. Principal cities

The capitals are the principal cities among the Barbary States. FEZ, one of the capitals of Morocco, is in the interior; but the Sultan and his court do not reside there all the year. Name the other capital. TANGIER, on the coast, is better known. Why should it be? In Algeria, the seaport ALGIERS is the capital and largest city. It is an interesting place, having both ancient and modern buildings side by side. Under the French it has become an important trading center. The same is true of TUNIS, the capital of the country by that name. Locate the capital of Tripoli.

3. Southern Africa

Points of similarity to northern Africa

In some important respects northern and southern Africa are much alike, although they lie in different hemispheres. How do they resemble each other in climate (p. 351) and surface features (p. 351)? There is a resemblance, too, in the fact that both sections have long been settled by white men. What difference is there in the length of time that white men have occupied the two regions?

Control of the region

1. By the Dutch

It is to the Dutch that we owe the first important development of South Africa. Settling at Cape Town, and then spreading over the neighboring region, they took possession of the country occupied by the negroes, and introduced the industries of farming and ranching.

When Cape Colony, now called Cape of Good Hope, came into possession of the British (p. 353), many of the Dutch remained; but others emigrated, or "trekked," northward to find new homes in the interior, where they set up two republics, the Transvaal and the Orange Free State, in which they wished to continue the customs of their forefathers and follow the occupations of farming and herding.

2. By the English and other peoples

Doubtless the *Boers*, as these people are called, would have been left to themselves but for the discovery of rich deposits of gold in their new territory. The mines were worked by British capital, and trouble arose between the mine owners and the Boers. War followed, as a result of which the Transvaal and the Orange Free State were declared British colonies in 1900. Even before this the British had gained control of a large tract of land to the north of the Dutch country, in tropical Africa.

At present, therefore, the British control a broad strip of territory from the southern tip of Africa northward to the southern end of Lake Tanganyika. What are the names of the British colonies in South Africa (Fig. 386)? They are now united to form *The Union of South Africa.*

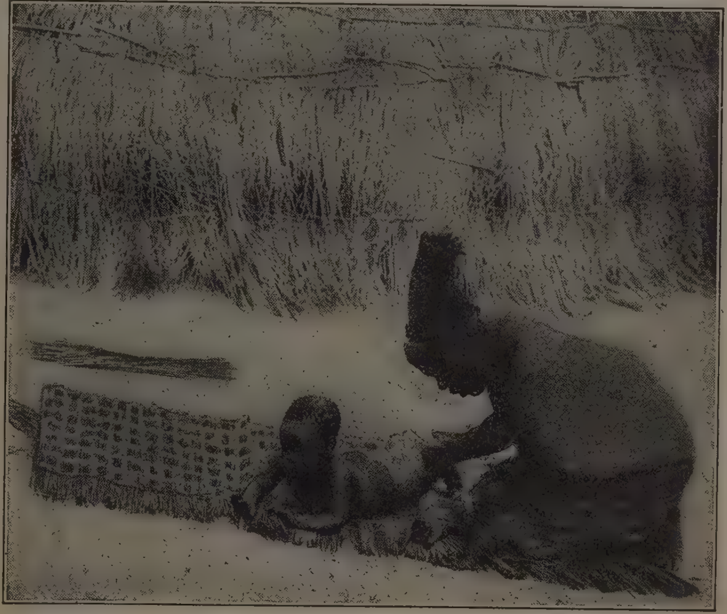


FIG. 400. — A Zulu woman making a carpet.

There are many British in South Africa, especially in Cape of Good Hope and at the gold mines of the Transvaal. There are also many savage negroes in this region, particularly in the tropical section, and in Zululand, in northern Natal. Some of them, like the Zulus (Fig. 400), have fiercely opposed the advance of the whites, and still maintain partial independence.

They have made some progress toward civilization.

Agriculture

Along the eastern coast, and in some of the interior valleys, agriculture is an important industry. Sugar cane, bananas, pineapples, tea, coffee, and rice are raised near the coast, where the climate is warm and damp. But wheat, tobacco, vegetables, and grapes are grown in the cooler south and upon the uplands wherever the rainfall is sufficient, or where irrigation is possible.

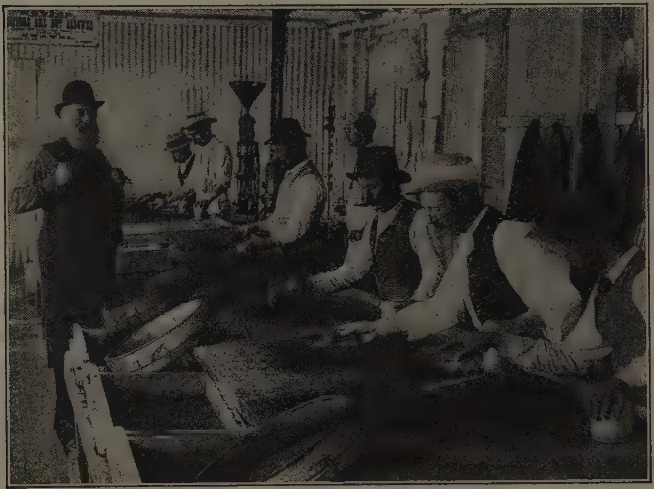


Fig. 401. — Workmen picking out diamonds at Kimberley.

By far the greater part of South Africa is an arid plateau, and its elevation causes cold winters in spite of the latitude. Forests are lacking; but grass springs into life after the summer rains (November and December), and the country becomes green and beautiful. Then follows a long drought, when vegetation withers; but, as in the arid part of western United States, the grass dries on the ground and becomes hay upon which cattle and sheep thrive.

Upon this plateau, therefore, immense numbers of cattle, sheep, and goats are raised, and also many ostriches. In Cape of Good Hope alone there are about nineteen million sheep and goats, two million cattle, and three hundred and fifty thousand ostriches. From this it follows that the production of wool, hides, meat, and ostrich feathers is of great importance. Of what value are these products to Great Britain?

Mining

The discovery of gold in South Africa has brought great changes, as it did in the arid section of western United States. The gold is found scattered through a large bed of rock in the Transvaal, near the city of JOHANNESBURG, which on account of the valuable mines has become one of the largest cities of South Africa. This is now the most important gold-producing region in the world; indeed, more gold is mined here than in the whole United States.

Other valuable minerals, including copper, iron, and coal, also occur; but as yet they have been little developed. At KIMBERLEY, there are wonderful diamond mines, which now supply most of the diamonds used in the world.

The diamonds occur as rounded crystals in a partly decayed volcanic rock, and are obtained by digging out the soft rock and carefully removing the crystals (Fig. 401). After this, the crystals must be cut into the proper shape and polished. There are various grades, some clear and beautiful, others impure and dull. So productive is this deposit of precious stones that it has already yielded three hundred million dollars' worth of diamonds.

The lack of conveniences for transportation

The two chief rivers of South Africa are of little use as trade routes. The Orange River is not navigable, because of lack of water; moreover, there are rapids at the edge of the plateau. The other large river, the Zambezi, is navigable by small boats for a distance of three hundred miles from its mouth; but the climate near the coast, especially on the delta, is warm, damp, and unhealthful. Rapids check further navigation, and at one point there is a cataract, the Victoria Falls, which rivals even Niagara in grandeur. This cataract has a width of over a mile, and a height of four hundred and fifty feet. It is therefore both wider and higher than Niagara; but the volume of water is less.

FIG. 402. — A steamboat on the Congo.

Not only are the rivers unsuited to the needs of internal commerce, but the coast is unfavorable to foreign commerce. For long distances there are no good harbors, while the river mouths are choked with sand bars.

Principal cities

A breakwater has made Table Bay a good port, and around its shores, beautifully situated at the base of Table Mountain (Fig. 386), is CAPE TOWN, the capital and largest city of Cape of Good Hope. It is connected with the interior by a railway, which forms the southern end of the proposed railway from Cape Town to Cairo.

A second important harbor is that of Delagoa Bay, upon which is situated LOURENÇO MARQUEZ, the capital of Portuguese East Africa. Being connected by rail with the interior, this port has been much used for the shipment of Transvaal products. DURBAN, the seaport of Natal, is a small city also connected with the Transvaal by rail. The two principal interior cities are KIMBERLEY and JOHANNESBURG. For what are they noted (p. 360)? There is no important town in German South-west Africa, which for the most part is an arid plateau. To what nation does *Walfisch Bay* belong?

FIG. 403. — Negroes and a native hut in Central Africa.

4. Central Africa

This vast area is in large part unknown. Much of it is tropical forest; but on the northern and southern sides are open savannas (p. 352).

Value of the rivers for transportation

Owing to the heavy rainfall of the forest belt, the rivers are large. The Nile and Zambezi, already described, and the Niger and Congo, all receive water from the equatorial rains. The Niger is navigable in sections; but there are rapids in some parts, and in its northern portion the river dwindles in size because of the dry climate there. Its large tributary, the Benue, is navigable.

It is the immense Congo, which empties into the sea a few degrees south of the equator, that offers the best natural highway to central Africa. Unfortunately there is a series of falls in the river a short distance from the coast; but above Stanley Pool there are thousands of miles of navigable waters in the main river (Fig. 402) and its tributaries.

The native inhabitants

Very few Europeans have settled in central Africa, and the native blacks live almost as their ancestors did. Most of the inhabitants live in huts made of brush, or some similar material, and clustered in villages. They have a kind of tribal government, each tribe having a leader whose power is absolute, and under whom are minor chiefs. Some of the tribes are cannibals.

Divisions of this region

European nations have been active in claiming the greater part of central Africa; but they have little real control over the native inhabitants. The following are some of the more important parts of central Africa.

1. The Sudan

The Sudan includes the vast area that lies between the Sahara and the tropical forest. What can you tell about its climate (p. 352)? More than half of the Sudan is claimed by the French, and most of the remainder, including *Nigeria* and the *Egyptian Sudan*, is held by the British. The inhabitants in the north are nomadic, while those in the south are agricultural, though they raise little more than is needed for their own use. There is some gold in the west; but the principal products are ivory, ostrich feathers, ebony, rubber, and gums.

2. Abyssinia and surrounding territory

East of the Sudan is *Abyssinia*, which is, for the most part, a rocky plateau, crossed by mountains, and difficult of access. The condition of this country is well shown by the fact that the position of the capital is changed when the supply of firewood is exhausted. It is evident, therefore, that there are no government buildings. The inhabitants, who are mainly of the white race, belong to different tribes which often quarrel with one another. Many of the people still hold to Christianity in spite of the invasion by Mohammedans nearly four centuries ago. The exports of Abyssinia include coffee, hides, skins, ivory, and gold.

Abyssinia is surrounded by colonies of other nations. Italy holds *Eritrea* and *Italian Somaliland*. What other nations occupy a part of the coast on the border of Abyssinia?

3. Small countries on the west coast

The map shows several small countries on the west coast of Africa. The divisions colored pink belong to the British; those marked green to the Germans. What are some of their names? Find a section belonging to Spain. What parts are controlled by France?

One of these small countries is *Liberia*, which is of special interest to Americans. It is a negro republic, established in 1822 by Americans as a home for freed slaves; and its capital, MONROVIA, is named after President Monroe. No white man is allowed to become a citizen. The republic was modeled after *Sierra Leone*, next to it on the west, which the British founded as a home for liberated slaves.

Belgian Congo and neighboring territory

Belgian Congo, crossed by the equator and drained by the Congo and its tributaries, was founded by Leopold, king of Belgium, who supported Stanley in his explorations of this region. It is now under the control of Belgium. It is in large part a forest-covered plateau, but there are extensive areas of grass land. Hordes of savages, including the pygmies, inhabit the forests and savannas; the buffalo, elephant, and leopard live on the plains; and the roar of the lion is frequently heard. Large quantities of rubber, ivory, palm oil, gum, and cocoa, as well as tropical woods, are obtained from this region. Some gold is also exported.

East of the Belgian Congo are British and German territories. What are their names? What can you tell about their climate (p. 352)? What products should you expect?

Observe to what extent the British claim Africa. What break is there in the British territory between the Cape of Good Hope and the Mediterranean? What variety of climate do these British colonies include?

The need of more railways here

Several railways have already been mentioned. Where are they? Besides these, and parts of the great rivers, the three large lakes — Nyassa, Tanganyika, and Victoria Nyanza — are of great service in the transportation of goods. Already there are steamers upon these lakes. A railway connects Victoria Nyanza with the sea, and others are planned. But many more railways are needed; for otherwise caravans of native porters must bear the products on their backs, traveling along narrow paths through the forest.

5. Madagascar

Islands on the east side

The island of Madagascar, which is larger than any of our states except Texas, lies a little more than two hundred miles from the mainland. It contains much highland, especially on the eastern side; but the coastal region is lowland. The island is controlled by the French, and produces cattle, hides, valuable tropical woods, rubber, and coffee. While there are some Arabs, and tribes of negro origin in the west, the natives are for the most part Malays, called *Hovas*, who came by water from the northeast.

Review Questions

1. What is the general shape of Africa? What about the regularity of its coast line? 2. Describe the arrangement of its mountains and lowlands. 3. State the effect of this arrangement on the rivers. 4. Where are the principal lakes, and what are their names? 5. Describe the climate in general. 6. Tell about the forest belt. 7. The savannas north and south of it. 8. The two desert regions. 9. What about the native plant and animal life? 10. What about the native inhabitants of Africa? 11. Tell about the exploration and settlement. 12. What are the divisions of northern Africa, and what is their form of government? 13. What is the area of the Sahara? 14. Describe its surface features. 15. Tell about the caravans there. 16. Describe the climate of Egypt. 17. What can you tell about the Nile River? 18. Name the agricultural products of Egypt. 19. Locate and describe the Suez Canal. 20. Locate and state the chief facts about the leading cities. 21. What about the surface, climate, and products of the Barbary States? 22. What is the character of the people? 23. Name and locate the principal cities. 24. How does the southern part of Africa resemble the northern part? 25. State what you can about the government of the southern part. 26. What do you know about the agriculture there? 27. The mining? 28. The lack of conveniences for transportation? 29. Locate and state the chief facts about the leading cities. 30. How valuable are the rivers of central Africa for transportation? 31. Tell about the native inhabitants. 32. Locate the Sudan and name its divisions. 33. State the principal facts about Abyssinia and surrounding territory. 34. Name and locate the small countries on the west coast. 35. State the principal facts about the Belgian Congo and neighboring territory. 36. Explain the need of railways there. 37. Locate and describe Madagascar.

General review questions and comparisons

1. Give several reasons why Africa has been explored and settled so much later than either North or South America. 2. What rivers of North America resemble those of Africa in having rapids and falls that interfere with commerce? How have these obstacles been overcome in our rivers? 3. Contrast the Mississippi River with the Nile. Make a drawing of each, showing the principal tributaries and towns. 4. Compare the Congo with the Missouri in length; with the Amazon (Appendix, p. 397). 5. Compare the area of Lake Victoria Nyanza with that of Lake Superior (Appendix, p. 397). 6. Is Africa, on the whole, as well adapted to agriculture as is South America? Give your reasons. 7. Make a sketch map of the Atlantic, and compare the position of Africa with that of

South America. What part of America is in the same latitude as the Sahara? 8. Cape Horn is how much farther south than Cape of Good Hope? 9. Why is not a large part of northern South America a desert, like northern Africa? 10. Compare southern Africa with southern South America in products and importance. Why the difference? 11. What products of Africa are also cultivated in the United States? 12. What products of Africa are not raised in our country?

Suggestions 1. What per cent of the present population of the United States belongs to the negro race? 2. Read the Bible story of Joseph in Egypt. 3. Read the story of Moses. 4. Find out some facts about the Pyramids. 5. Why is England especially benefited by the Suez Canal? 6. What obstacles are in the way of building railways across the Sahara? 7. Read about our short war with Tripoli in 1804. 8. Why was the southern point of Africa called the Cape of Good Hope? 9. Find out something about the missionary work in Africa. 10. Find out about the peculiar animal life upon the island of Madagascar.

III. AUSTRALIA AND ISLAND GROUPS

1. Australia

Map Questions 1. Judging from the railways and cities, which is the best settled part of Australia? 2. Which part is least settled? 3. Can you suggest any reasons for these facts? 4. From the lakes and rivers, what do you conclude concerning the climate of the interior? 5. How does Tasmania compare in area with Pennsylvania (Appendix, p. 391)? With your own state? 6. Make the same comparison for New Zealand. 7. For Borneo and New Guinea. 8. What nations claim parts of Borneo? New Guinea?

Location and area Australia lies apart from the rest of the world. It is the smallest of the continents, the only continent wholly surrounded by water, and the only continent wholly in the southern hemisphere. With its area of three million square miles, it approaches the United States or Europe in size.

Surface features The surface, like that of Ireland, suggests a plate in form, since the low interior rises gradually to a broken rim of plateaus and mountains of moderate height. While there are some low, short ranges in the interior, the highest land is in the east, where the mountains run parallel to the coast. In the southeast some of the peaks reach a height of over a mile.

The coast of Australia is so regular that for long distances there are no good harbors; but the sinking of the land in the southeastern part has formed some excellent ports. Off the northeastern coast is the *Great Barrier Reef*, the longest coral reef in the world.

Climate What is the latitude of the northern part of Australia? Of the southern part? What, therefore, can you say about the temperature of the continent?

Australia lies within the belt of the southeast trade winds (Fig. 233). The eastern highland, therefore, has an abundant rainfall, on its seaward side, and is clothed with dense forests. After crossing the mountains, however, the winds are so dry that the forest gradually disappears; and the interior is a vast desert. It is therefore only along portions of the coast that there is enough rainfall for agriculture, while the interior, and much of the greater part of the continent, is either arid or desert.

Effect of rainfall on rivers and distribution of population The maps of Australia show a striking lack of large rivers. Some of the streams end in salt lakes, and others evaporate, so dry is the climate. Many unite with the Darling and Murray rivers; but these only at times are navigable for long distances. During the dry summer season all except the Murray may dwindle to mere chains of water holes. A sand bar at the mouth of the Murray River closes it to ocean steamers, so that, unlike the Mississippi, no large cities have grown up along its banks.

Partly because of the desert, and partly because of the absence of navigable streams,

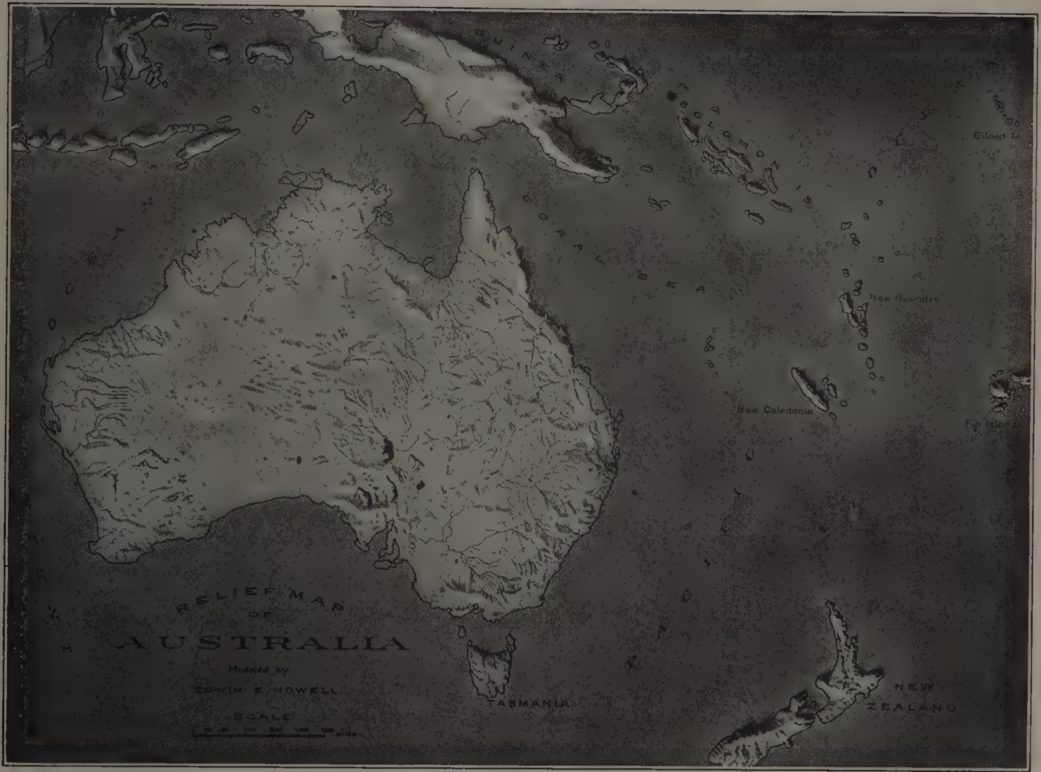


FIG. 404. — Relief map of Australia.

there are large tracts in the interior about which, even now, little is known. Only the southeastern part seems capable of supporting a dense population.

History

1. Native inhabitants and their manner of life

When discovered, Australia was sparsely settled by blacks, related to the negroes of Africa. Some of these natives still live in the interior, building the rudest of shelters, and gaining their living by hunting. They still use that peculiar weapon, the *boomerang*, which, when skillfully thrown, will fly in curves and even return to the thrower.

2. Early settlement

Although it had long been known that there was an Australian continent, settlements were not made there until 1788. For a time the distant land was used as an English prison; and naturally, under such conditions, not many free settlers came to the country. Some came, however, and as their number increased, they brought it about that criminals were no longer sent there.

3. Effect of discovery of gold

Almost at the same time that gold was discovered in California, it was also found in Australia, and tens of thousands of people rushed there to wash the sands for the precious metal. Since the miners needed supplies, many of the settlers turned their attention to other industries, especially agriculture and grazing. Therefore, in Australia, as in California, the gold mines quickly led to the development of the country's resources.

New South Wales, as the first colony was

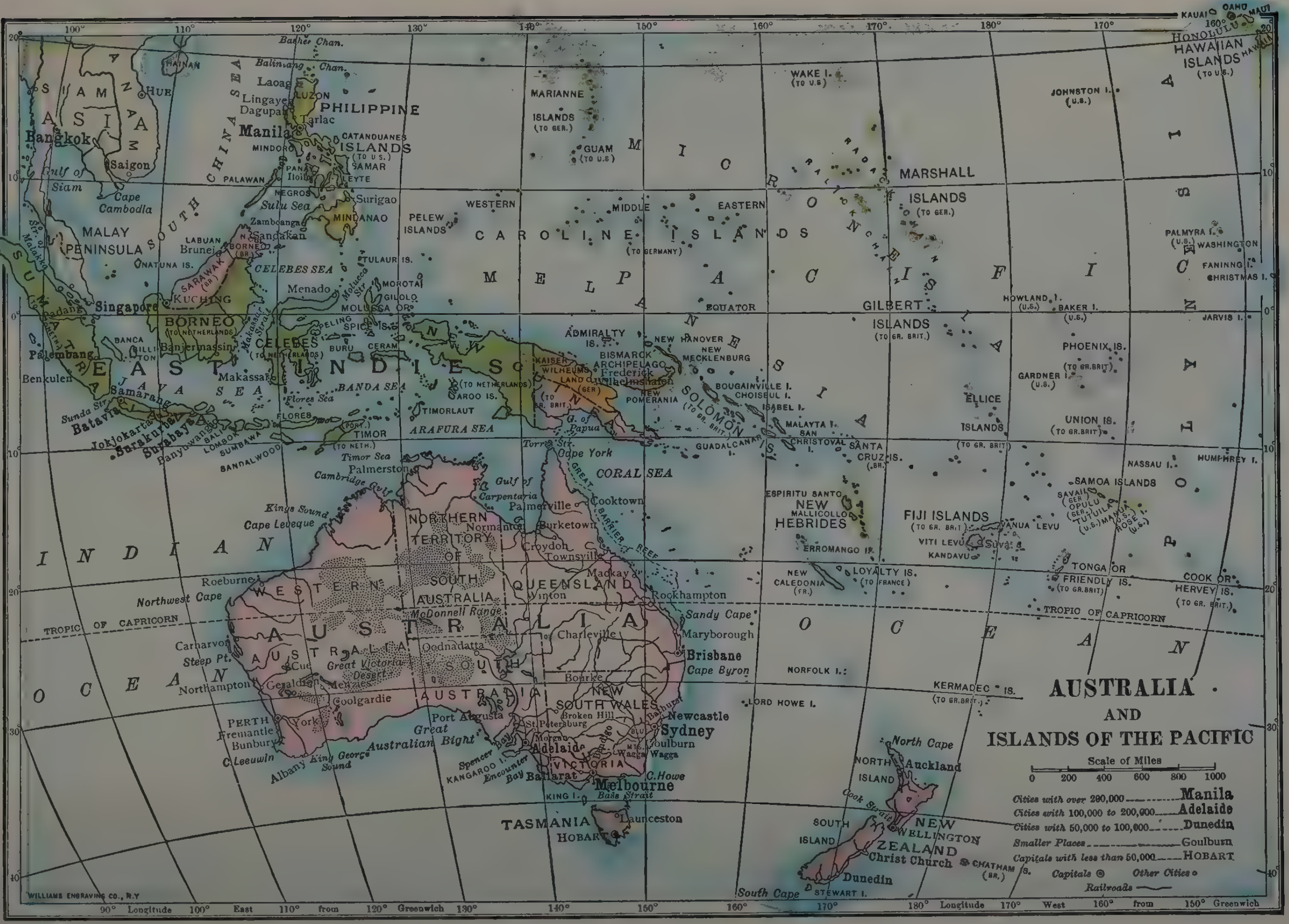

AUSTRALIA
AND
ISLANDS OF THE PACIFIC
Scale of Miles
0 200 400 600 800 1000
Cities with over 200,000 Manila
Cities with 100,000 to 200,000 Adelaide
Cities with 50,000 to 100,000 Dunedin
Smaller Places Goulburn
Capitals with less than 50,000 HOBART
Capitals
Other Cities
Railroads
WILLIAMS ENGRAVING CO., N.Y.
90° Longitude 100° East 110° from 120° Greenwich 130°
180° Longitude 170° West 160° from 150° Greenwich
INDIAN OCEAN
PACIFIC OCEAN
TROPIC OF CAPRICORN
EQUATOR
ASIA
SIAM
ANNAM
Bangkok
Saigon
Hue
HAINAN
Gulf of Siam
Cape Cambodia
MALAY PENINSULA
SOUTH CHINA SEA
Str. of Malakka
SUMATRA
Padang
Singapore
Palembang
Benkulen
Sunda Str.
Batavia
JAVA
Samarang
Jokjokarta
Surakarta
Surabaya
JAVA SEA
BANCA
BILLITON
BORNEO (TO NETHERLANDS)
SARAWAK (BR.)
KUCHING
LABUAN
Brunei
N. BORNEO (BR.)
Sandakan
NATUNA IS.
Banjermassin
Makassar Strait
CELEBES (TO NETHERLANDS)
Makassar
Menado
CELEBES SEA
Sulu Sea
PHILIPPINE ISLANDS (TO U.S.)
LUZON
Manila
Laoag
Lingayen
Dagupan
Tarlac
Bashee Chan.
Balintang Chan.
CATANDUANES
MINDORO
PALAWAN
PANAY
Iloilo
NEGROS
SAMAR
LEYTE
MINDANAO
Surigao
Zamboanga
TULAUR IS.
MOROTAI
GILOLO
MOLUCCA OR SPICE IS.
Molucca Str.
PELING
BURU
CERAM
BANDA SEA
Flores Sea
FLORES
BALI
LOMBOK
SUMBAWA
SANDALWOOD
TIMOR (PORT.) (TO NETH.)
Timor Sea
TIMORLAUT
AROO IS. (TO NETHERLANDS)
ARAFURA SEA
EAST INDIES
NEW GUINEA
KAISER WILHELMS LAND (GER.)
Friedrich Wilhelmshafen
(TO GR. BRIT.)
G. of Papua
Torres Str.
ADMIRALTY IS.
BISMARCK ARCHIPELAGO
NEW HANOVER
NEW MECKLENBURG
NEW POMERANIA
SOLOMON IS. (TO GR. BRIT.)
BOUGAINVILLE I.
CHOISEUL I.
ISABEL I.
MALAYTA I.
GUADALCANAR
SAN CHRISTOVAL I.
SANTA CRUZ IS. (BR.)
MELANESIA
MICRONESIA
POLYNESIA
MARIANNE ISLANDS (TO GER.)
GUAM (TO U.S.)
PELEW ISLANDS
CAROLINE ISLANDS (TO GERMANY)
WESTERN
MIDDLE
EASTERN
RADAK
RALIK
MARSHALL ISLANDS (TO GER.)
GILBERT ISLANDS (TO GR. BRIT.)
ELLICE ISLANDS (TO GR. BRIT.)
WAKE I. (TO U.S.)
JOHNSTON I. (U.S.)
HAWAIIAN ISLANDS (TO U.S.)
KAUAI
OAHU
MAUI
HAWAII
Honolulu
PALMYRA I. (U.S.)
WASHINGTON
FANINNG I.
CHRISTMAS I.
HOWLAND I. (U.S.)
BAKER I. (U.S.)
JARVIS I.
PHOENIX IS. (TO GR. BRIT.)
GARDNER I. (U.S.)
UNION IS. (TO GR. BRIT.)
NASSAU I.
HUMPHREY I.
SAMOA ISLANDS
SAVAII (GER.)
OPULU (GER.)
TUTUILA (U.S.)
MANUA (U.S.)
ROSE (U.S.)
FIJI ISLANDS (TO GR. BRIT.)
VANUA LEVU
VITI LEVU
Suva
KANDAVU
TONGA OR FRIENDLY IS. (TO GR. BRIT.)
COOK OR HERVEY IS. (TO GR. BRIT.)
NEW HEBRIDES
ESPIRITU SANTO
MALLICOLLO
ERROMANGO I.
NEW CALEDONIA (FR.)
LOYALTY IS. (TO FRANCE)
NORFOLK I.
LORD HOWE I.
KERMADEC IS. (TO GR. BRIT.)
CORAL SEA
GREAT BARRIER REEF
AUSTRALIA
WESTERN AUSTRALIA
NORTHERN TERRITORY OF SOUTH AUSTRALIA
QUEENSLAND
SOUTH AUSTRALIA
NEW SOUTH WALES
VICTORIA
Cape York
Gulf of Carpentaria
Palmerville
Normanton
Burketown
Croydon
Cooktown
Townsville
Mackay
Winton
Rockhampton
Sandy Cape
Maryborough
Brisbane
Cape Byron
Charleville
Bourke
Newcastle
Sydney
Goulburn
Wagga Wagga
Broken Hill
St. Petersburg
Morgan
Adelaide
Port Augusta
Spencer Gulf
KANGAROO I.
Encounter Bay
Ballarat
Melbourne
C. Howe
KING I.
Bass Strait
TASMANIA
HOBART
Launceston
McDonnell Range
Oodnadatta
Great Victoria Desert
Cue
Menzies
Coolgardie
Geraldton
Northampton
York
PERTH
Fremantle
Bunbury
C. Leeuwin
Albany
King George Sound
Great Australian Bight
Carnarvon
Steep Pt.
Roeburne
Northwest Cape
Kings Sound
Cape Leveque
Cambridge Gulf
Palmerston
NEW ZEALAND
NORTH ISLAND
SOUTH ISLAND
North Cape
Auckland
Cook Strait
WELLINGTON
Christ Church
Dunedin
STEWART I.
South Cape
CHATHAM IS. (BR.)

FIG. 405.

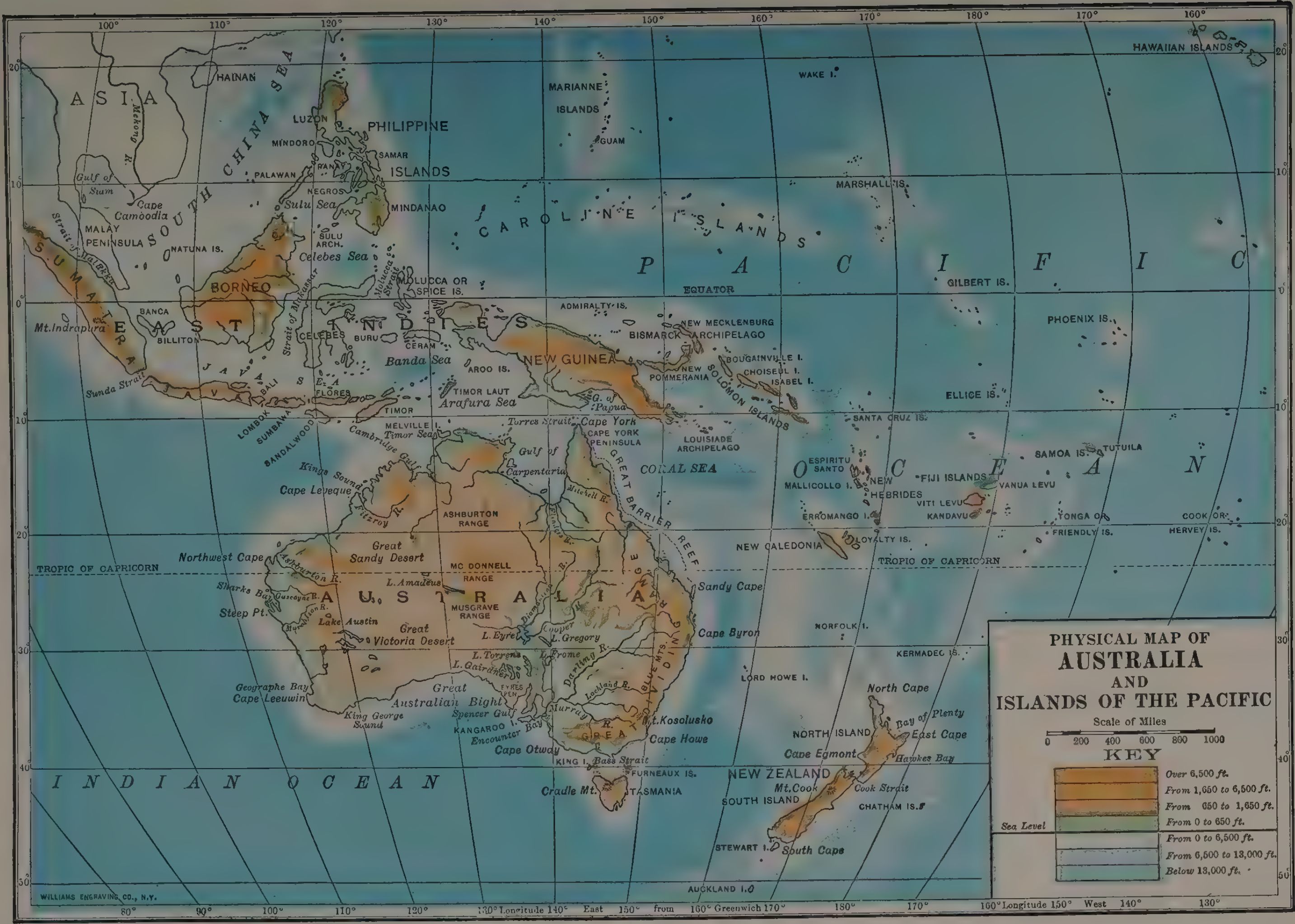

PHYSICAL MAP OF
AUSTRALIA
AND
ISLANDS OF THE PACIFIC
Scale of Miles
0 200 400 600 800 1000
KEY
Over 6,500 ft.
From 1,650 to 6,500 ft.
From 650 to 1,650 ft.
From 0 to 650 ft.
Sea Level
From 0 to 6,500 ft.
From 6,500 to 13,000 ft.
Below 13,000 ft.
ASIA
Mekong R.
HAINAN
SOUTH CHINA SEA
Gulf of Siam
Cape Camodia
MALAY PENINSULA
Strait of Malacca
NATUNA IS.
SUMATRA
Mt. Indrapura
BANCA
BILLITON
BORNEO
LUZON
MINDORO
PALAWAN
PANAY
NEGROS
SAMAR
PHILIPPINE ISLANDS
MINDANAO
Sulu Sea
SULU ARCH.
Celebes Sea
Molucca Strait
MOLUCCA OR SPICE IS.
Strait of Makassar
CELEBES
BURU
CERAM
EAST INDIES
JAVA
Sunda Strait
BALI
LOMBOK
SUMBAWA
FLORES
SANDALWOOD
TIMOR
Banda Sea
AROO IS.
TIMOR LAUT
Arafura Sea
MELVILLE I.
Timor Sea
Cambridge Gulf
Kings Sound
Cape Leveque
Fitzroy R.
Torres Strait
Cape York
CAPE YORK PENINSULA
Gulf of Carpentaria
Mitchell R.
Flinders R.
GREAT BARRIER REEF
CORAL SEA
ASHBURTON RANGE
Great Sandy Desert
MC DONNELL RANGE
L. Amadeus
MUSGRAVE RANGE
Great Victoria Desert
Lake Austin
AUSTRALIA
Northwest Cape
Ashburton R.
Sharks Bay
Gascoyne R.
Murchison R.
Steep Pt.
Geographe Bay
Cape Leeuwin
King George Sound
Great Australian Bight
Spencer Gulf
KANGAROO I.
Encounter Bay
EYRES PEN.
L. Eyre
L. Torrens
L. Gairdner
Cooper
L. Gregory
L. Frome
Diamantina R.
Darling R.
Lachlan R.
Murray R.
GREAT DIVIDING RANGE
BLUE MTS.
Mt. Kosciusko
Cape Howe
Cape Otway
KING I.
Bass Strait
FURNEAUX IS.
TASMANIA
Cradle Mt.
Sandy Cape
Cape Byron
TROPIC OF CAPRICORN
INDIAN OCEAN
EQUATOR
MARIANNE ISLANDS
GUAM
CAROLINE ISLANDS
WAKE I.
MARSHALL IS.
HAWAIIAN ISLANDS
PACIFIC OCEAN
GILBERT IS.
PHOENIX IS.
ELLICE IS.
ADMIRALTY IS.
NEW GUINEA
G. of Papua
BISMARCK ARCHIPELAGO
NEW MECKLENBURG
NEW POMMERANIA
SOLOMON ISLANDS
BOUGAINVILLE I.
CHOISEUL I.
ISABEL I.
LOUISIADE ARCHIPELAGO
SANTA CRUZ IS.
ESPIRITU SANTO
MALLICOLLO I.
NEW HEBRIDES
ERROMANGO I.
NEW CALEDONIA
LOYALTY IS.
FIJI ISLANDS
VANUA LEVU
VITI LEVU
KANDAVU
SAMOA IS.
TUTUILA
TONGA OR FRIENDLY IS.
COOK OR HERVEY IS.
NORFOLK I.
KERMADEC IS.
LORD HOWE I.
North Cape
Bay of Plenty
East Cape
Hawkes Bay
NORTH ISLAND
Cape Egmont
Cook Strait
NEW ZEALAND
Mt. Cook
SOUTH ISLAND
CHATHAM IS.
STEWART I.
South Cape
AUCKLAND I.
100° 110° 120° 130° 140° 150° 160° 170° 180° 170° 160°
20 10 0 10 20 30 40 50
80° 90° 100° 110° 120° 130° Longitude 140° East 150° from 160° Greenwich 170° 180° 170° 160° Longitude 150° West 140° 130°
WILLIAMS ENGRAVING CO., N.Y.

FIG. 406.

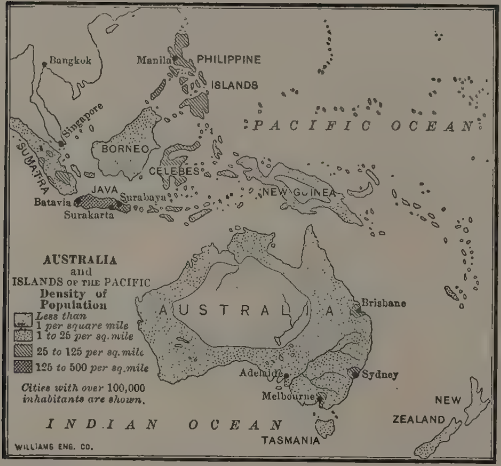


Fig. 407. — Density of population in Australia and neighboring islands.

4. Government

called, finally grew so large, and the settlements were so scattered, that it became difficult to control the whole colony under a single government. To meet this difficulty, Tasmania, Victoria, and Queensland were one by one set off as separate colonies. South Australia and Western Australia were settled as distinct colonies.

The colonies have so many interests in common, that, in 1901, they united to form the *Commonwealth of Australia.* This new commonwealth has a government similar to that of Canada, and is independent of England in all matters except those which affect the British Empire as a whole.

Agriculture

1. Sheep raising

Although it was gold that brought the rush of settlers to Australia, her greatest wealth lies in her flocks of Merino sheep. Australian wool is the finest in the world.

In the early days of Australia the flocks were reared upon the unfenced government land, as in the western part of the United States (p. 121). The sheep were driven to pasture and watered and cared for at night by lonely shepherds, much as in the days of David. Now, however, the land is largely fenced with wire, each sheep station having its own *run,* or ranch. To-day grazing is the most typical as well as the leading occupation in Australia. There are over eighty-

Fig. 408. — Harvesting oats in Australia.

three million sheep, and the wool is the principal export of the commonwealth.

2. Farming

On the damp lowlands, where there is rainfall enough, and in the interior where irrigation is possible, there is much farming. Next to hay, wheat (Fig. 419) is the most important crop, and flour forms one of the chief exports of the country.

The farm products vary with the climate. For example, oats and other hardy grains are raised in the cooler south, while corn is important only from New South Wales northward. There are large sugar plantations in Queensland; and along the northern coast tropical products are obtained. Much fruit is raised, and this, too, varies with the climate. Oranges are grown in the north, and the orchard and small fruits of cool temperate lands in the south. In Victoria and South Australia, there are many vineyards.

Fishing and mining

On the coral reefs east of the mainland, and along the northern coast of Australia, small sailboats are engaged in fishing for pearls, pearl shell, and other products of tropical waters.

The gold of Australia, like that of California, was first found in the gravels; but mines were later opened along the veins in the mountain rocks. Gold mining is still very important, and Australia ranks third among gold-producing nations (Fig. 439).

Copper, silver, and tin are other important metals found in Australia. Coal of good quality exists in several places, the best-developed field being near the coast of New South Wales. Rich iron ores, together with limestone, are found near these coal fields.

Manufacturing

Some wool is woven into cloth; some leather is tanned and made into shoes; and much flour is made from the wheat. There are sawmills and planing mills; and other forms of simple manufacturing are carried on. But most of the manufactured goods used in the country are imported. They are largely obtained from England, and are paid for with raw products.

Principal cities

1. The capitals

Australian cities have grown very rapidly, and one third of the people live in the capitals of the six divisions of the commonwealth. These capitals are seaports connected with the interior by railway, and have therefore become the leading commercial centers. They have fine government buildings and large public parks and gardens.

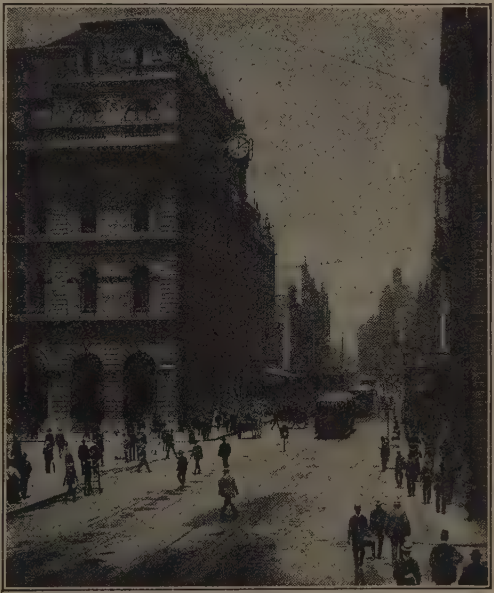


FIG. 409. — A street in Sydney, in New South Wales.

MELBOURNE, the largest city in size in Australia and the capital of Victoria, is beautifully situated at the head of a broad harbor. SYDNEY (Fig. 409), the second city in size in Australia and the capital of New South Wales, was founded in 1788, and is, therefore, the oldest city of Australia. Both of these cities rank among the great seaports of the British Empire. ADELAIDE is a third large city. Of which division is it the capital? Name the other capitals.

2. Mining centers

Since nine tenths of the Australians live on the coast lands, much of the commerce is carried on by means of steamboats, and most of the cities are seaports connected by rail with the interior farms, mines, and sheep country. A few mining centers, like BALLARAT and BENDIGO, in Victoria, have become large towns.

2. Island Groups

New Zealand

1. Surface and climate

More than a thousand miles southeast of Australia are the two large mountainous islands of New Zealand. In South Island there are great glaciers among the mountains; while in North Island there are active volcanoes, and also hot springs and geysers (Fig. 410), like those of the Yellowstone National Park.

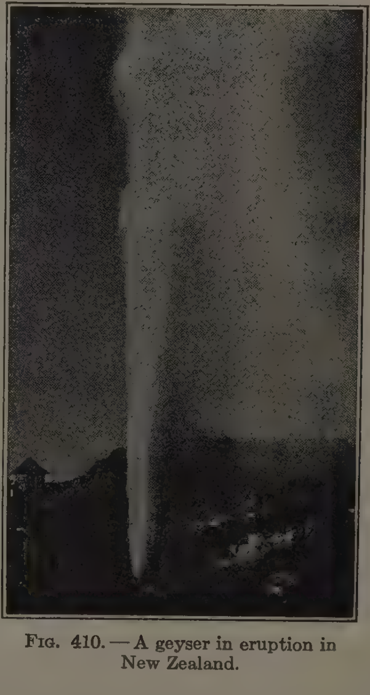


FIG. 410. — A geyser in eruption in New Zealand.

Since these islands lie in the belt of stormy west winds, there is heavy rainfall on the western slopes. The mountains are therefore clothed with forests of pine and other trees. On the lee, or eastern, slopes the rainfall is less, and the land is covered with wiry grasses. What effect must the presence of water on all sides have upon the temperature?

2. Industries and government

As in Australia, pastoral industries take the lead. There are twenty million sheep, and wool and frozen mutton are exported to England. Cattle are likewise kept, and butter is exported. Agriculture is important, but much land that is suited to farming has never been cleared of forest.

In the south the crops are those of the cool temperate belt; but in the north the climate is mild enough for the growth of oranges. There are gold, silver, and coal mines among the mountains; and valuable timber is obtained from their slopes. Manufacturing is only slightly developed, and is chiefly for home use.

The situation of these islands, in the temperate zone, is favorable to rapid progress, and the British people who have settled here have done much to develop the resources. They have also established one of the best governments in the world. Being so far away from Australia, and therefore, with such different interests, New Zealand has not joined the Australian Commonwealth.

3. Commerce and chief cities

Several short lines of railway connect the settled interior with the seaports; roads and stage lines extend to the more distant districts; and steamers ply around the coasts and to distant countries. There are four cities of nearly the same size, the smallest of which is DUNEDIN, and the largest, AUCKLAND. Find the other two.

The East Indies

1. Divisions among them

Between Asia and Australia are hundreds of islands, some very large, others so small that they find no place on our map. Of these the greater number have animals, plants, and people similar to those of Asia. New Guinea, however, which is nearest to Australia, resembles that continent rather than Asia.

Many of the islands of this region, including Sumatra, Java, the Celebes, and a large part of Borneo and New Guinea, are

Dutch colonies. What nations control the island of Timor? What three nations have possession of New Guinea?

2. Government of the islands

The immense size of these islands is shown by the fact that Java has a greater area than New York State, while Sumatra is larger than California. Borneo, one of the largest islands in the world, is larger than all the New England and Middle Atlantic States together.

3. Their area

New Guinea, another of the largest islands in the world, has an area greater than that of Texas. The Dutch East Indies alone are fifty-eight times as large as the Netherlands, and have over six times as many inhabitants, or not quite half as many as the United States.

All of the larger islands are mountainous; in fact, they are parts of mountain ranges rising out of the sea, and among them are many active volcanoes, some of which have had terribly destructive eruptions. Many of the smaller islands are merely coral reefs slightly raised above the ocean.

4. Their surface and climate

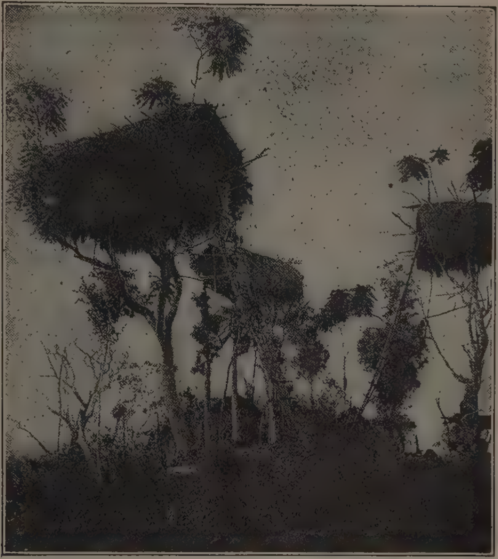


Fig. 411. — New Guinea houses built in trees.

Lying so near the equator, all the islands have a tropical temperature and heavy rainfall. The dampness and heat together make them very unhealthful in places. Because of the climate, and of the mountains and the dense jungles, there are large areas which have never been explored.

The forests supply valuable woods and gums, including rubber and camphor. Large

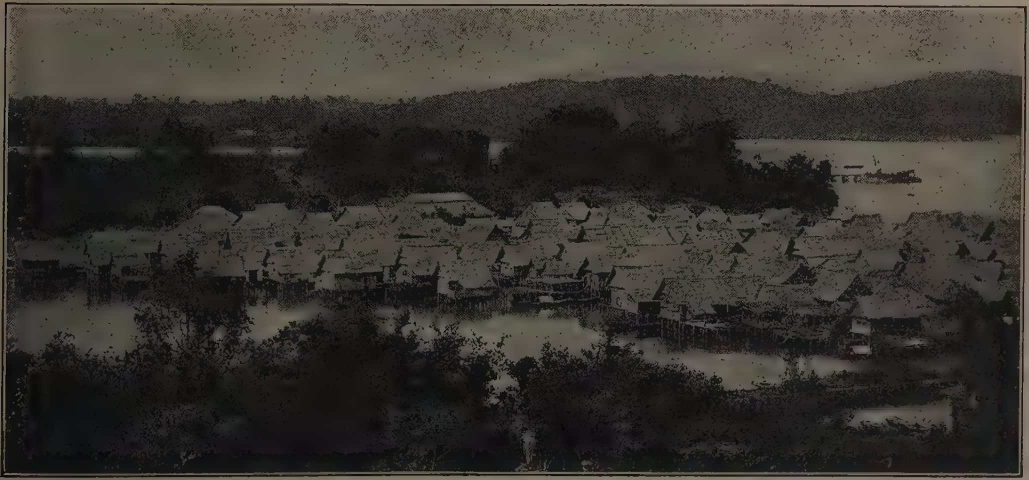


Fig. 412. — A Malay village built on piles in the water.

5. The products

areas, especially in Java, are highly cultivated and produce quantities of rice, sugar cane, and coffee. In the production of the last two articles, Java is one of the leading regions of the world (Figs. 423 and 424). Among the noted products of the East Indies are spices, such as pepper, cloves, and nutmegs; in fact, one of the island groups is known as the Spice Islands. What is its other name? There are also valuable minerals, including tin, gold, and precious stones; and in the tropical sea beautiful pearl shells are found.

The largest city among all the islands in this region is MANILA, in the Philippines; and next in size is BATAVIA, the center of the Dutch Colonial government.

Islands of the Pacific

The map (Fig. 405), shows the western Pacific dotted with island groups; but all these islands are very small. What names among them have you heard before? Name and locate those that belong to the United States. All together, these thousands of islands have a population of less than a million persons.

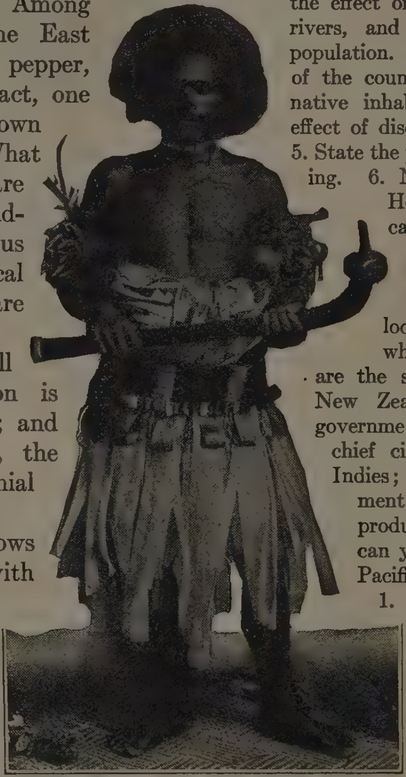


FIG. 413. — A native of Fiji Islands.

The "high," or volcanic islands, like Fiji and New Caledonia, have peaks which rise several thousand feet. On these islands there are sugar and coffee plantations, as in Hawaii, while tropical fruits, such as bananas and pineapples, are raised in large quantities.

On the "low," or coral islands, on the other hand, the cocoanut palm is the mainstay of human life, supplying food, clothing, shelter, boats, and many utensils. Copra, the main export from Samoa, and from many other Pacific islands, is the dried meat of the cocoanut. It is of value for food, as well as for its oil.

Review Questions

1. Describe the surface of Australia, including the coast line. 2. Describe the climate. 3. State the effect of the rainfall on rivers, and distribution of population. 4. In the history of the country, give some facts about the native inhabitants; the early settlements; effect of discovery of gold; the government. 5. State the principal facts about sheep ranching. 6. Name the chief farm products. How are they distributed? 7. What can you say of fishing? 8. What mineral products are found? 9. What is the condition of manufacturing? 10. Name and locate the principal cities. For what is each important? 11. What are the surface features and climate of New Zealand? 12. The industries and government? 13. Name and locate the chief cities. 14. Tell about the East Indies; divisions among them; government; area; surface and climate; products and chief city. 15. What can you tell about the islands of the Pacific?

General review questions and comparisons

1. Australia resembles South Africa in its surface, climate, occupations, and products. Show how this is true. 2. Australia also resembles the western part of the United States in climate, in occupation and products, and in the order of development of her resources. Show how this is true, also. 3. In what respects does southern South America (Chile and Argentina) resemble Australia? 4. What part of Australia has the same latitude, in the southern hemisphere, that southern Florida has in the northern? 5. Which one of our states most nearly equals New Zealand in area? 6. What peninsula of Europe resembles New Zealand in shape? How do the two countries compare in area? In population? 7. What part of South America most resembles the East Indies in climate and products? What part of North America most resembles them in these respects?

1. If it were within your power, how would you arrange the highlands of Australia so as to secure

Suggestions

the most even distribution of rain? 2. Estimate the greatest length of New Zealand. Compare it with a line extending from New Orleans northward. 5. Estimate the distance from Batavia to Manila. 4. Write your impression of the climate of Melbourne in January; in July. 5. Through some fruit dealer obtain a cocoanut in its husk, and examine it. 6. Read Whittier's poem on the Palm Tree. 7. Learn something about the work of missionaries in the small Pacific islands. 8. Collect pictures for the school, showing the Pacific islands and their life. 9. By what routes can one go from New York City to Australia? Through what waters? Which route is shortest? About how many miles shorter? 10. Answer the same questions for a voyage from New York to Manila.

PART VI. REVIEW OF UNITED STATES AND COMPARISON WITH OTHER COUNTRIES

How many places in this list of 67 cities can you locate? Use the index, pp. 399–410, to help locate each place. Mention the most important thing for which the city is noted.

Review of locations

Rio de Janeiro
Buenos Ayres
Santiago
Valparaiso ✓
London
Liverpool
Birmingham
Manchester
Glasgow
Edinburgh
Dublin
Belfast
Paris

Marseille
Lyon
Brussels
Amsterdam
The Hague
Copenhagen
Antwerp
Stockholm
Berlin
Hamburg
Leipzig
Dresden
Munich

Vienna
Budapest
Petrograd
(St. Petersburg)
Moscow
Warsaw
Odessa
Rome
Milan
Venice
Naples
Madrid
Barcelona
Lisbon

Athens
Constantinople
Jerusalem
Peking
Tientsin
Nanking
Shanghai
Canton
Hongkong
Tokio
Yokohama
Madras
Calcutta
Bombay

Delhi
Singapore
Batavia
Belgrade
Cairo
Alexandria
Tripoli
Algiers
Tangier
Johannesburg
Cape Town
Sydney
Melbourne
Manila

Area and population

In spite of the vast extent of the United States, there are four empires in the Old World with a greater *area*. Which are they (Fig. 414)? Which country is fifth in size? Sixth? Compare the United States with each of these in area.

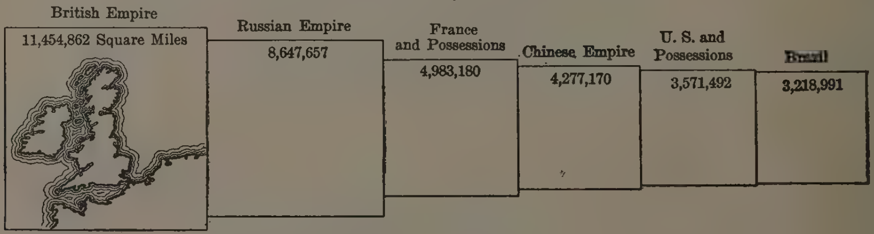


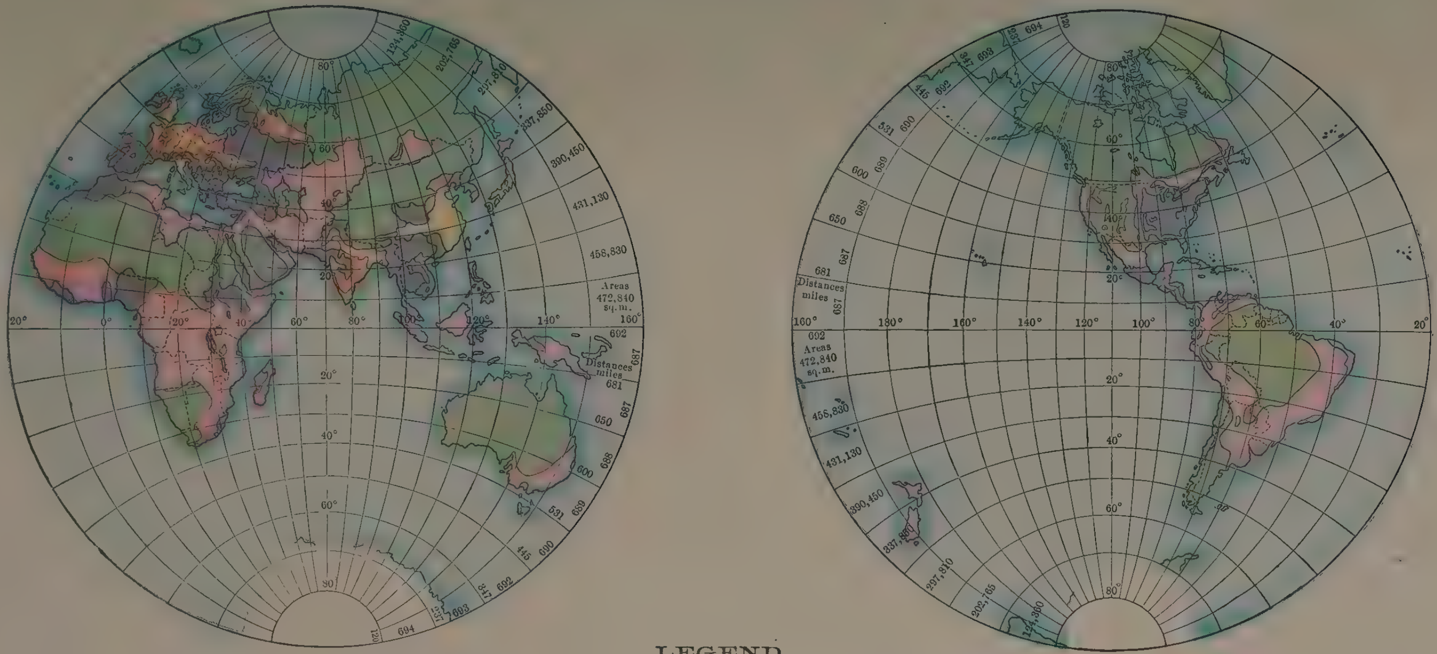
FIG. 414.—Areas of six largest nations (1910).

The United States ranks fourth in *population* (Fig. 416). Name the six most populous countries in the order of their rank. Figure 417 shows the *density of population*, or the number of people per square mile, in some of the countries in the world. From this it will be seen that the United States is very thinly settled, compared with many countries. Compare the United States in this regard with Belgium, England, Cuba, Mexico, and Canada.

Density of population in several countries

Name and locate the principal mountain systems in the United States; the chief ranges in the West. Describe the drainage of the United States. Name and locate our principal rivers. Which continent has its principal mountains arranged most like those of North America? Show

DISTRIBUTION OF PEOPLE IN THE WORLD



LEGEND

Grade of Peopling	Colored thus	People to one square mile
Very dense	🟨	250 *or more*
Dense	🟧	125 *to* 250
Moderate	🟦	26 *to* 125
Thin	🟥	2½ *to* 26
Scanty	🟩	*Less than* 2½

Compiled by Prof. Mark Jefferson

FIG. 415.

Surface features

this. How does the arrangement of mountains in North America compare with that of Europe? Compare the surface of the United States with that of European Russia (p. 280); of Brazil (p. 224); of China (p. 333).

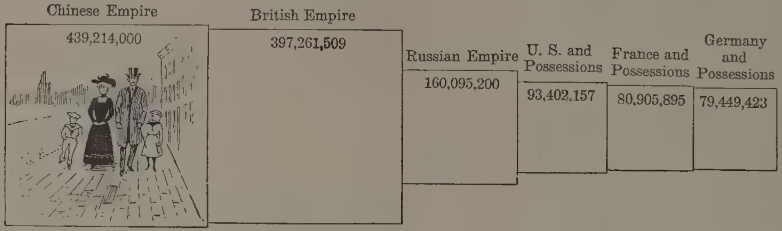


Fig. 416. — Population of six most populous nations (1910).

Climate

What is the latitude of the northern and of the southern boundary of the United States? Compare the latitude of our country with that of the British Isles (Fig. 2); with that of Germany, Italy, Egypt, India, China, Argentina, Australia.

How do ocean currents affect the temperature of the eastern part of our country? Of the western part (p. 207)? Compare our temperature with that of countries in Europe having most nearly the same latitude (p. 243). Why the difference (p. 243)?

Tell about the prevailing winds and the rainfall in western United States (p. 197); the cyclonic storms and their effects (p. 201); the prevailing winds of Europe (p. 244); the rainfall there, with reasons (p. 203). In what respects are North America and Europe alike in regard to winds and rain?

Native plants and animals

What about native plants and animals in the northern part of North America (p. 9)? In the arid part of the United States (p. 10)? In other parts of the United States (p. 11)? In tropical North America (p. 11)? Compare the native plants and animals of North America with those of South America (p. 222); Europe; Africa (p. 352); Asia; Australia (p. 368).

Raw food products

1. Corn

In spite of the fact that some nations are larger and more densely settled, the United States leads the world in many very important respects, and approaches leadership in several others. Figure 418 shows that no nation is a close rival to us in the area of *corn* production. What countries, however, raise large quantities of it? Why is no corn raised in the British Isles (p. 249)?

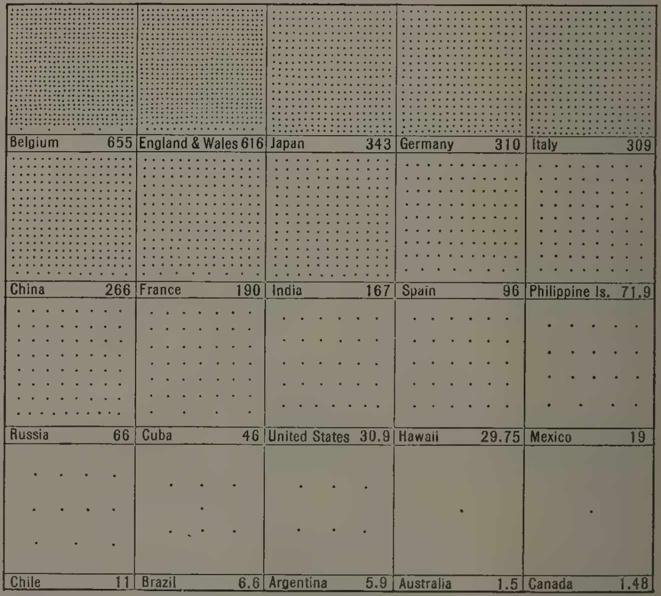


Fig. 417. — Density of population of some of the countries of the world (1910).

2. Wheat

Wheat is more widely cultivated than corn (Fig. 419). Yet we rank second in the production of that grain. Point out (Fig. 419) the leading wheat fields of the world. Which sections are important for both wheat and corn? On which side of the Atlantic is wheat raised farthest north? Why? Name in order the six countries that lead in the production of this grain (Fig. 420).

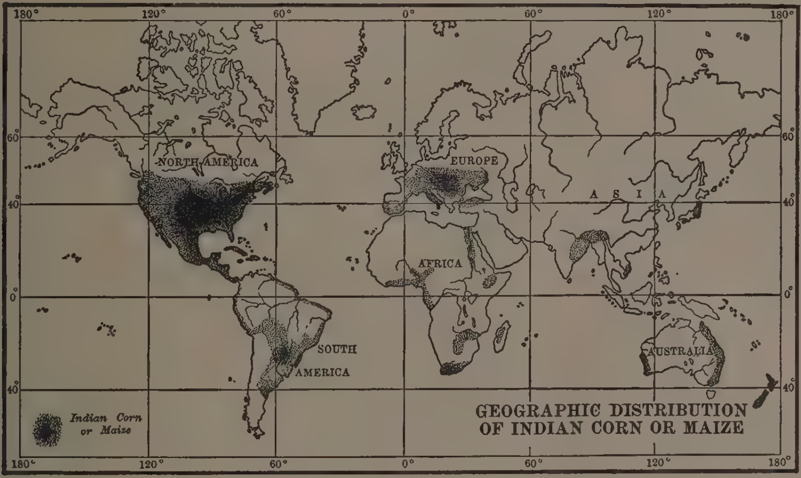


Fig. 418. — Corn sections of the world.

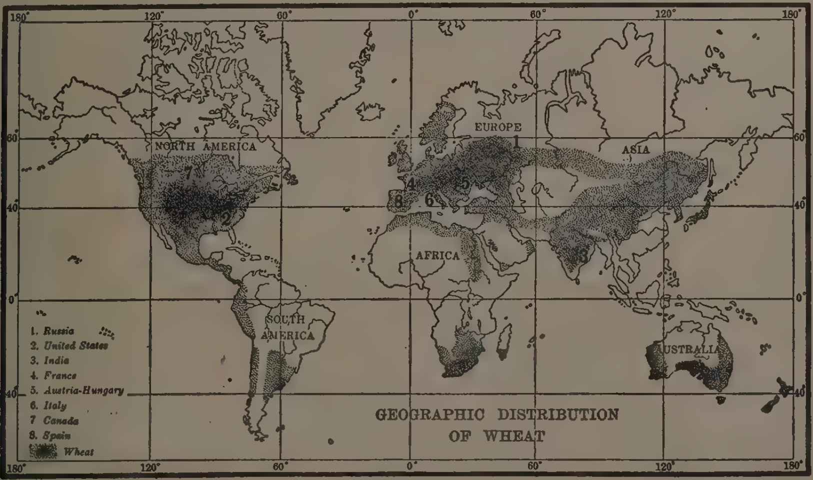


Fig. 419. — Wheat sections of the world.

3. Sugar cane and sugar beets

Note what sections of the world raise *sugar cane* and *sugar beets* (Fig. 421). Name countries and islands engaged in these industries. Is it mainly the sugar beet or sugar cane that is raised in Europe? Why? What is our rank in the raising of sugar cane and sugar beets (Fig. 422)? Name the six regions that lead in this kind of agriculture.

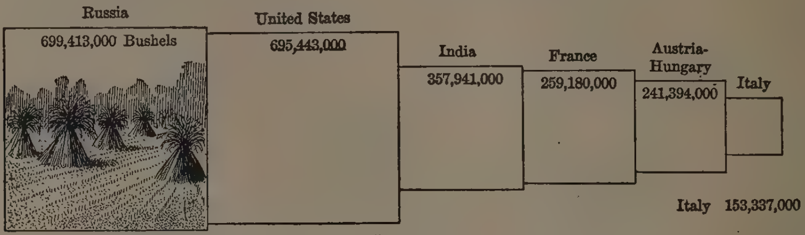


Fig. 420. — Six leading wheat-producing countries (1910).

4. Rice

Figure 423 shows the principal *rice* sections of the world. What continent grows by far the largest amount? What countries in that continent? What other parts of the world produce much of it? What parts of the United States? What climate does it require, and how is it raised (p. 59)?

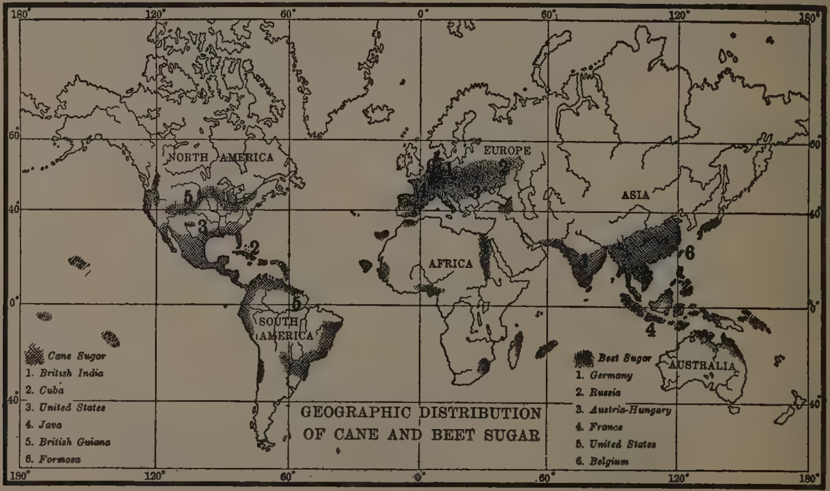


Fig. 421. — Sugar cane and sugar beet sections of the world.

5. Coffee

Figure 424 shows that coffee is not grown within our states, although in almost every household it is used every day. Notice, however, that it is produced in Cuba, Porto Rico, and the Philip-

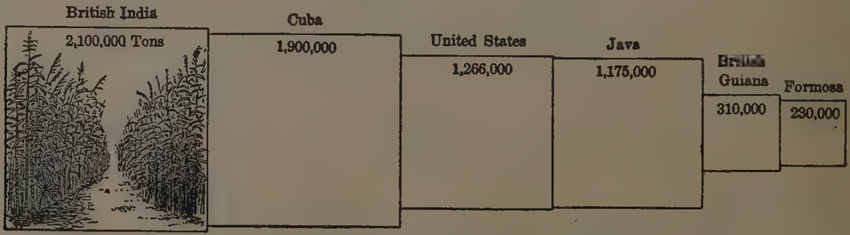


Fig. 422. — The six countries producing the most cane sugar (1910).

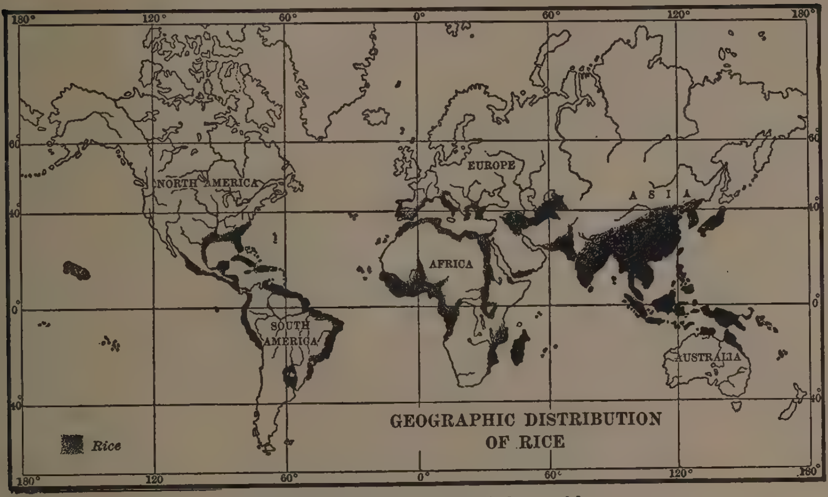


FIG. 423. — Rice sections of the world.

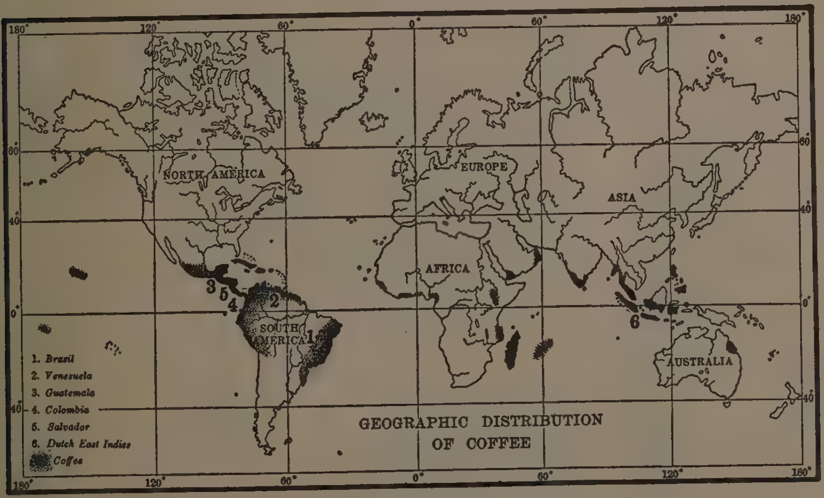


FIG. 424. — Coffee-producing sections of the world.

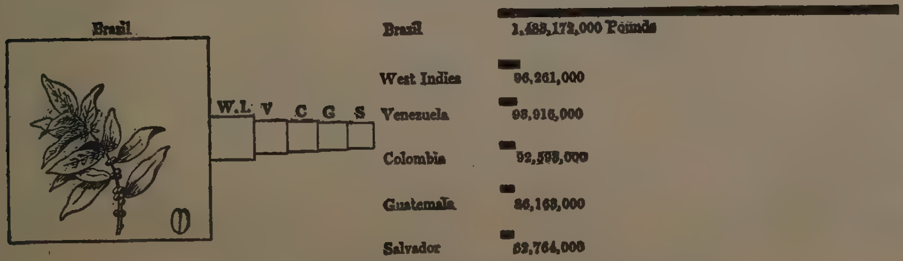


FIG. 425. — Leading coffee-producing countries (1910).

pine Islands (Fig. 424). To what climate and countries is it confined? State the rank of the principal coffee-producing sections, and compare their output (Fig. 425).

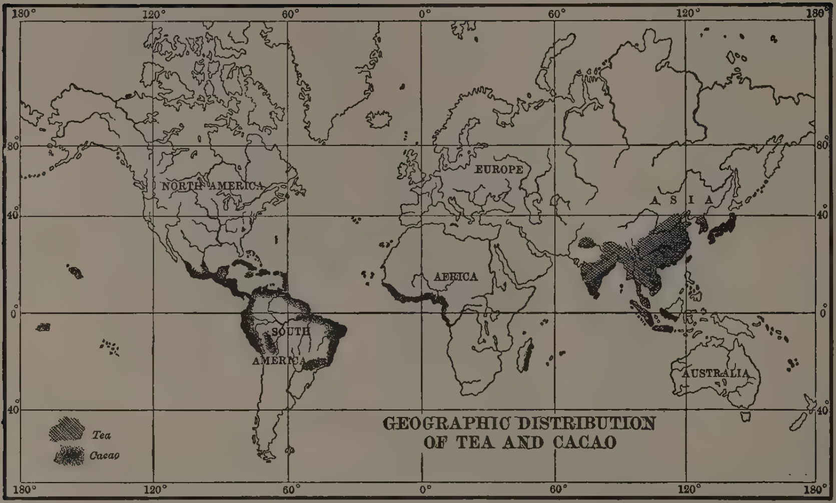


FIG. 426. — Tea- and cocoa-producing sections of the world.

6. Tea

Our *tea*, also, comes almost entirely from abroad. Mainly from what parts of the world? Name the principal countries and islands.

7. Meat

Note the distribution of *cattle* and *sheep* (Fig. 427). What countries are included? Recall some facts concerning sheep raising in Australia, Argentina, and the United States. Why are cattle and sheep raised in the same regions?

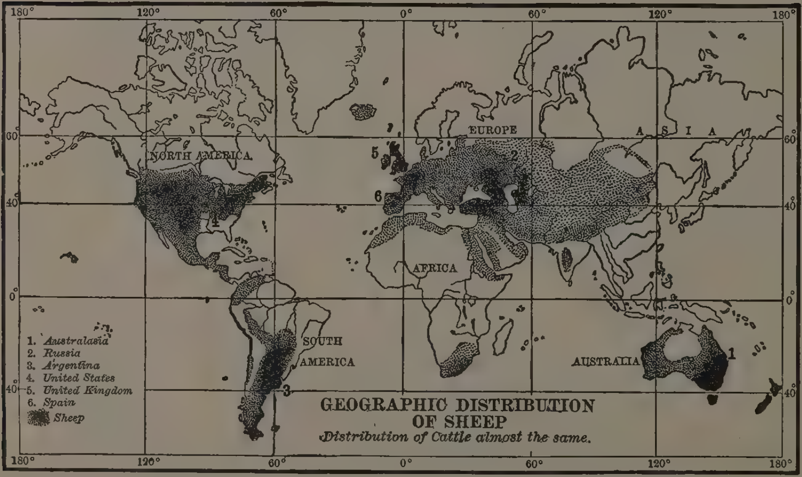


FIG. 427. — Cattle and sheep sections of the world.

Raw textile products

1. Wool

Figure 428 shows the six leading *wool*-producing countries. Name them. What is the rank of the United States?

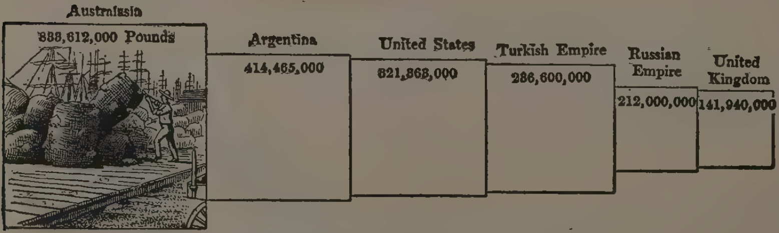


FIG. 428. — The six leading wool-producing countries (1910).

Cotton is limited to warm climates, so that fewer countries raise it.

2. Cotton Name the principal sections (Fig. 429). Within what parallels of latitude are they found? Name the five countries that lead in its production (Fig. 430). How much greater is the output of the United States than that of the five other countries together?

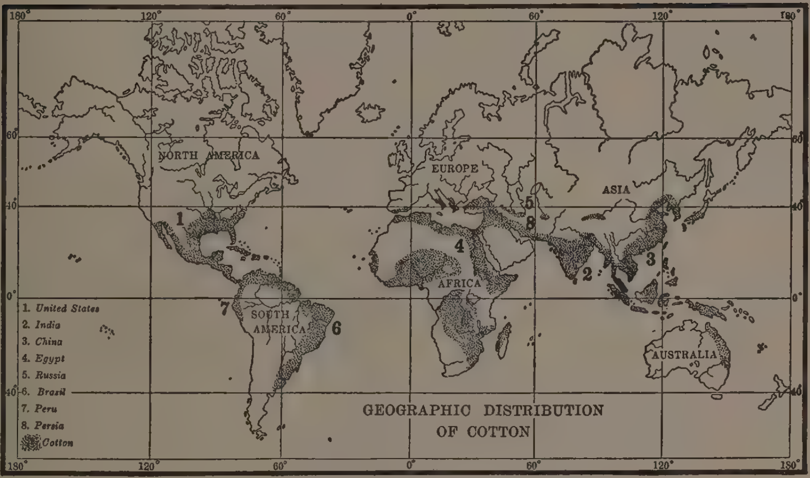


Fig. 429. — The cotton sections of the world.

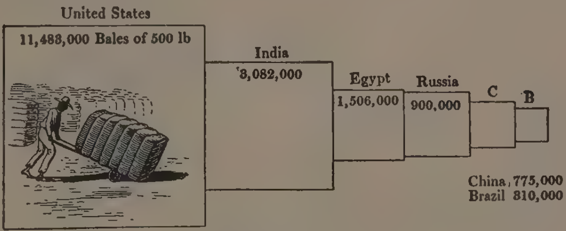


Fig. 430. — The six leading cotton-producing countries (1910).

Figure 431 shows the sections that produce silk. What are their names?

3. Raw silk What about this industry in the United States? Name the countries, in order, that produce most raw silk (Fig. 432). Recall how the work is carried on (Fig. 298).

The great importance of *coal and iron*

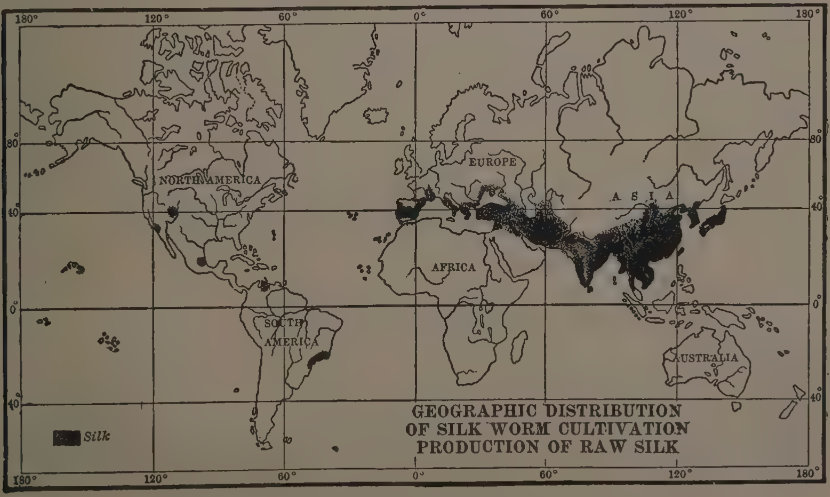


Fig. 431. — The raw-silk-producing sections of the world.

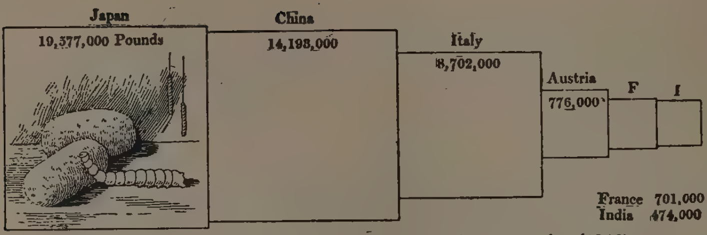


FIG. 432. — The six leading raw-silk-producing countries (1910).

for *use in manufacturing* has often been pointed out. Figure 433 shows that the *coal fields* are very limited. What countries have little or no coal? Name the leading coal-producing sections, and state the rank of the United States in the production of this mineral (Fig. 434).

Mineral products

1. Coal

2. Petroleum

The United States leads the world in the production of *petroleum*, or mineral oil (Fig. 435). The second most important district is in Russia, near the Caspian Sea. Other districts produce little petroleum. What are its uses?

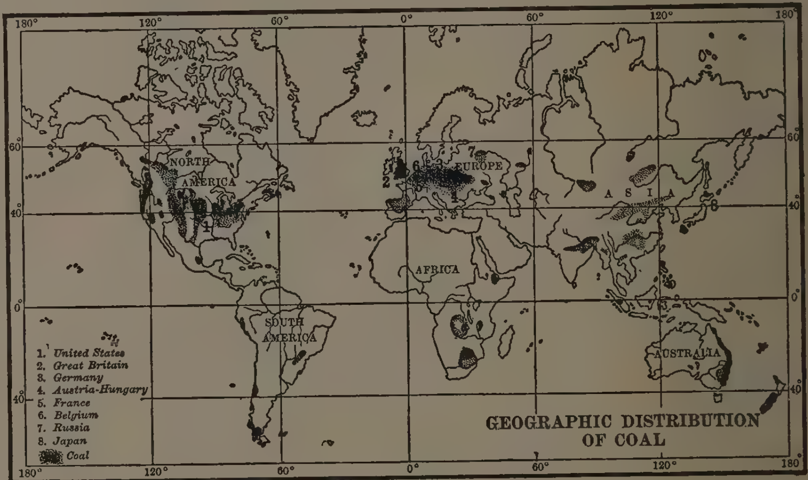


FIG. 433. — Leading coal-producing sections of the world.

3. Iron ore and pig iron

Is *iron ore* more or less widely distributed than coal (Fig. 436)? How does the United States rank in the output of this mineral (Fig. 437)? How does the output of coal and iron correspond to the importance of countries as manufacturing nations (Fig. 442)?

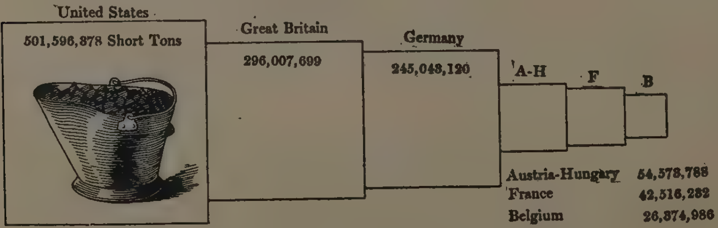


FIG. 434. — The six leading coal-producing countries (1910).

4. The precious metals

Tell about the distribution of gold (Fig. 438), and give our rank in the production of that metal (Fig. 439).

Where are the principal *silver*-mining sections (Fig. 440)? How does the United States compare with other countries in this product (Fig. 441)? Notice to what extent the world is indebted to the New World for silver. How does the value of the total silver production compare with that of gold in the five leading regions for each?

5. Other mineral products

The United States produces great quantities of other minerals. Name some of them (pp. 172 and 174). In the production of some, such as copper and natural gas, our country also leads.

According to Figure 442, what two continents

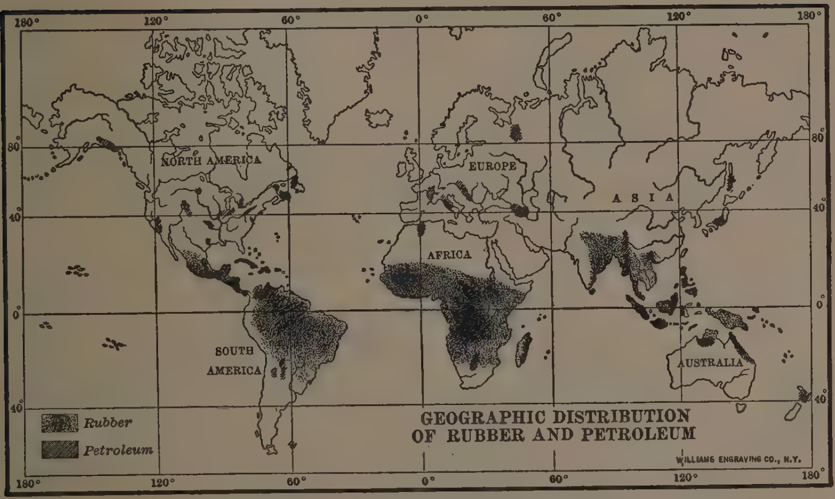


FIG. 435. — The leading petroleum-producing sections of the world.

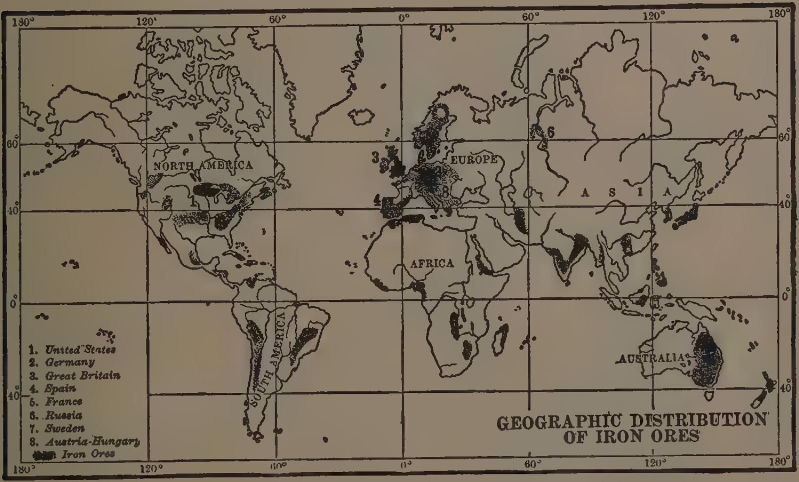


FIG. 436. — Leading sections of the world that produce iron ore.

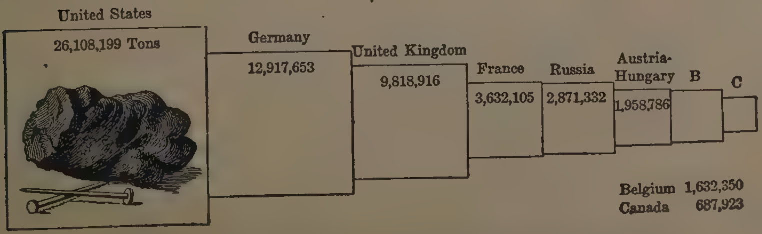


FIG. 437. — The eight leading pig-iron-producing countries (1910).

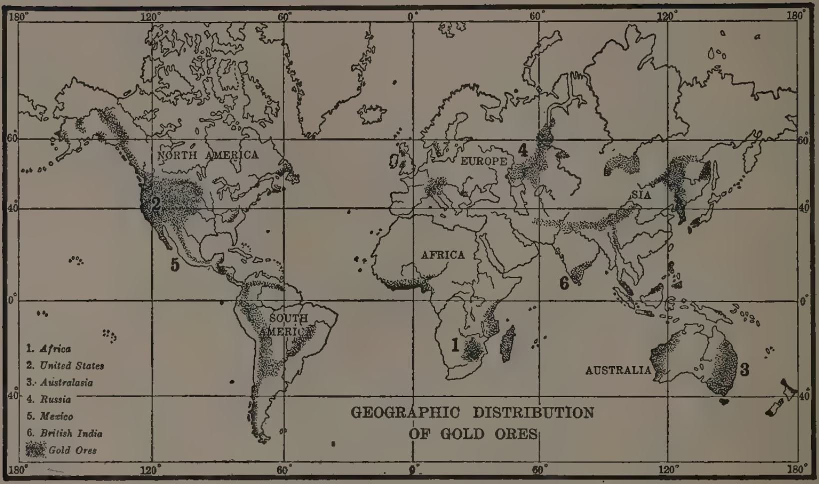


FIG. 438. — Leading gold-producing sections of the world.

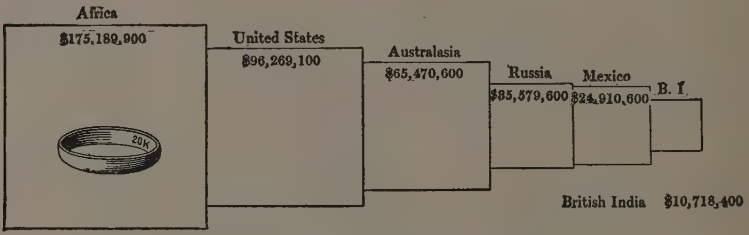


FIG. 439. — The six leading gold-producing countries (1910).

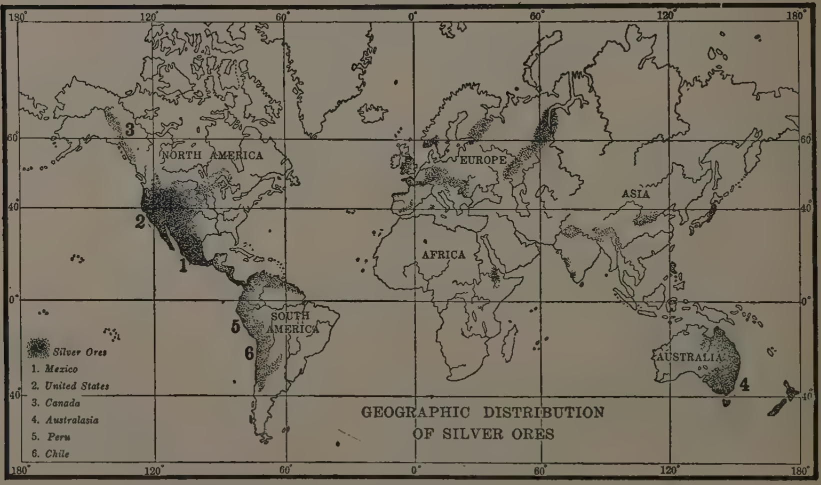


FIG. 440. — Leading silver-producing sections of the world.

Manufacturing

lead in *manufacturing?* What other smaller sections are active in this industry? Taking into account the size of our country, the abundance of our raw materials, and the energy and intelligence of our people, it is not surprising that we surpass all other countries in such work (Fig. 443). State the rank of other leading nations in this occupation.

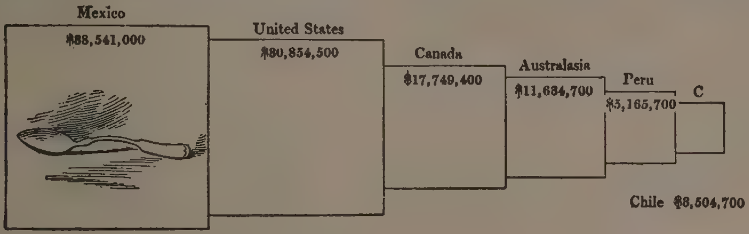


FIG. 441. — The six leading silver-producing countries (1910).

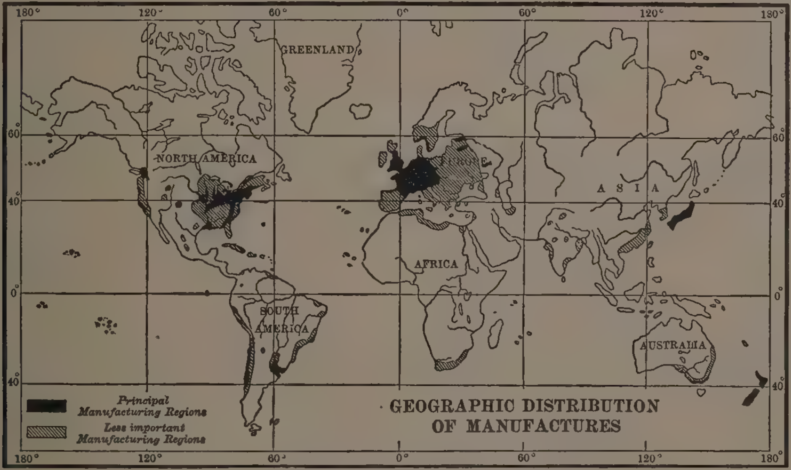

180°
120°
60°
0°
60°
120°
180°
60
40
0°
40
GREENLAND
NORTH AMERICA
EUROPE
ASIA
AFRICA
SOUTH AMERICA
AUSTRALIA
Principal Manufacturing Regions
Less important Manufacturing Regions
GEOGRAPHIC DISTRIBUTION OF MANUFACTURES

FIG. 442. — Manufacturing sections of the world.

Into what articles is corn manufactured in the United States (p. 86)? Where (p. 87)? Answer the same questions about wheat (p. 96). What are the leading centers for the preparation of meats in the United States (p. 98)? What countries in South America are extensively engaged in this industry (pp. 227 and 228)? In what parts of the United States is most cotton manufacturing carried on (p. 65)? Why there? What other countries have much cotton manufacturing? What countries of the world are noted for the manufacture of pig iron and other iron and steel goods? Name great centers for this industry in our own country; in foreign countries.

In provision for transportation by rail the

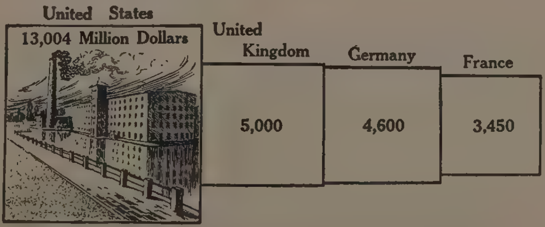


FIG. 443. — The four leading manufacturing countries.

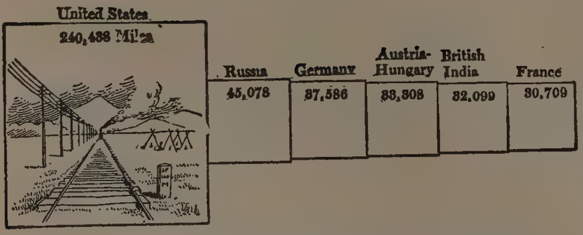


FIG. 444. — The six countries having greatest length of railways (1910).

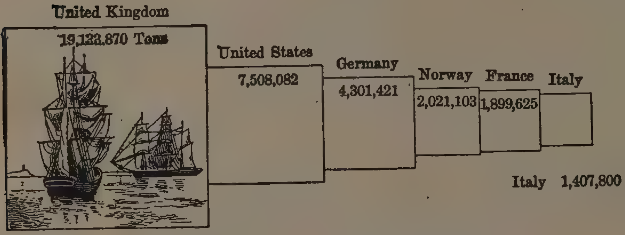


FIG. 445. — The six countries having the largest merchant marine (1910).

United States also takes the leading place. It has a far greater number of miles of railway than any other nation (Fig. 561); but several small European nations have a greater number of miles in proportion to their area.

Commerce

1. Conveniences for transportation

The United States ranks second in provision for *transportation by water* (Fig. 445). State the rank of the five chief countries in total length of *railways*, and in *merchant marine*. Give reasons why the United Kingdom should lead in merchant marine (p. 258). Why should Norway be of importance in this respect (p. 277)?

2. Our trade with foreign countries

(1) *Our exports*

We produce many more raw products and manufacture many more goods than we can use. These we send abroad, or *export*, to other countries, and for that reason they are called our *exports*. Our ten leading exports, named in order of value, together with the principal countries to which the goods are sent, are as follows: —

ARTICLES	PRINCIPAL COUNTRIES TO WHICH THEY ARE SENT
1. Cotton (mainly unmanufactured)	United Kingdom, Germany, France, Italy.
2. Breadstuffs (wheat, corn, flour, etc.)	United Kingdom, Germany, Belgium, Netherlands.
3. Meat and dairy products	United Kingdom, Germany, Belgium, France.
4. Iron and steel, and manufactures of	Canada, Mexico, Japan, United Kingdom.
5. Mineral oils (crude and refined)	United Kingdom, Germany, China, Netherlands.
6. Copper, and manufactures of	Netherlands, Germany, United Kingdom, France.
7. Wood, and manufactures of	United Kingdom, Canada, Mexico, Argentina.
8. Leather, and manufactures of	United Kingdom, West Indies, Mexico, Canada.
9. Tobacco, and manufactures of	Canada, Mexico, West Indies.
10. Coal	United Kingdom, Italy, Germany, France.

Name from memory our principal exports in the order of their value.

(2) *Our imports*

While there is thus an enormous quantity of goods that we *sell* to other countries, we must also *buy* many other things. One of these is coffee, as shown in Figure 425; we produce far less sugar each year than we consume; we depend wholly on foreign nations for raw silk (Fig. 432); our tea comes almost entirely from abroad (Fig. 426); and while much rice is produced in our Southern States, a large amount has to be purchased. These goods, and many others, have to be brought to our shores, or *imported*, from other countries, and for that reason they are called our *imports*.

Our ten leading imports, named in order of value, together with the principal countries from which they come, are as follows: —

ARTICLES	SOME OF THE PRINCIPAL COUNTRIES FROM WHICH THEY COME
1. Silk, and manufactures of	Japan, France, Italy, China.
2. Fibers, and manufactures of	Mexico, East Indies, Philippines.
3. Sugar	Cuba, East Indies, Germany (beet sugar).
4. Chemicals, drugs, and dyes	Germany, United Kingdom, France.
5. Cotton, and manufactures of	United Kingdom, Germany, France, Switzerland.
6. Coffee	Brazil, Central America, Venezuela, Colombia, Mexico.
7. Hides and skins	East Indies, United Kingdom, Russia, Argentina, Mexico.
8. Wood, and manufactures of	Canada, Sweden, Germany.
9. Wool, and manufactures of	United Kingdom, Australia, France, Germany.
10. India rubber and gutta-percha	Brazil, Mexico.

3. Principal transportation routes on the oceans

Figure 446 shows the ocean routes that vessels engaged in the commerce between nations generally take between the United States and Europe. To what European countries do they extend? Trace other routes across the Atlantic, and tell what countries they connect. Name some goods that are carried in each case, if you can. Do the same for the Pacific.

4. The dependence of nations upon one another

Our many exports and imports show how dependent we are upon other countries. We are wonderfully favored in the abundance of our resources. Yet it would be of no use to produce so many things if foreign countries did not buy some of them.

Again, although we have so many products, there are still many things that we need from other lands. It is true that we probably could depend upon ourselves for all that we want better than any other nation. The English, for instance, would starve within a few weeks, if no food were imported there. Yet note the things that we import. How do they compare, in value, with our exports? Thus, in spite of our great resources, we are really very dependent upon other countries.

Owing to our trade relations with the United Kingdom, what hardships would probably be brought upon the British if they entered upon a war with us? How might the Germans suffer if they were at war with us? How might the French suffer? On the other hand, what hardships would come to us in each case?

Wealth of nations

All the preceding facts prepare us for Figure 447, which shows that the United States is the *wealthiest nation* on the face of the earth. Compare our wealth with that of other leading countries.

Reasons why we promise great progress in the future

The figures and diagrams that you have studied show that several European countries compete actively with the United States in the *world's trade*. Give examples.

1 and 2. Our youthfulness and abundance of room

So far as the future is concerned, however, several important facts are in our favor. In the first place, we are still in our youth as a people, while some of the leading nations of Europe have, perhaps, already reached the height of their power. In the second place, the territory of most of those countries is densely settled, as shown in Figure 417. Note the number of inhabitants per square mile in Belgium, Germany, and France. When we contrast with these figures our average of only thirty persons per square mile, our possible future growth seems almost without limit. Immense tracts of land, which in Europe would be carefully tilled, are in our country not even cleared for pasture. In no large section of the United States do we even approach the careful til-

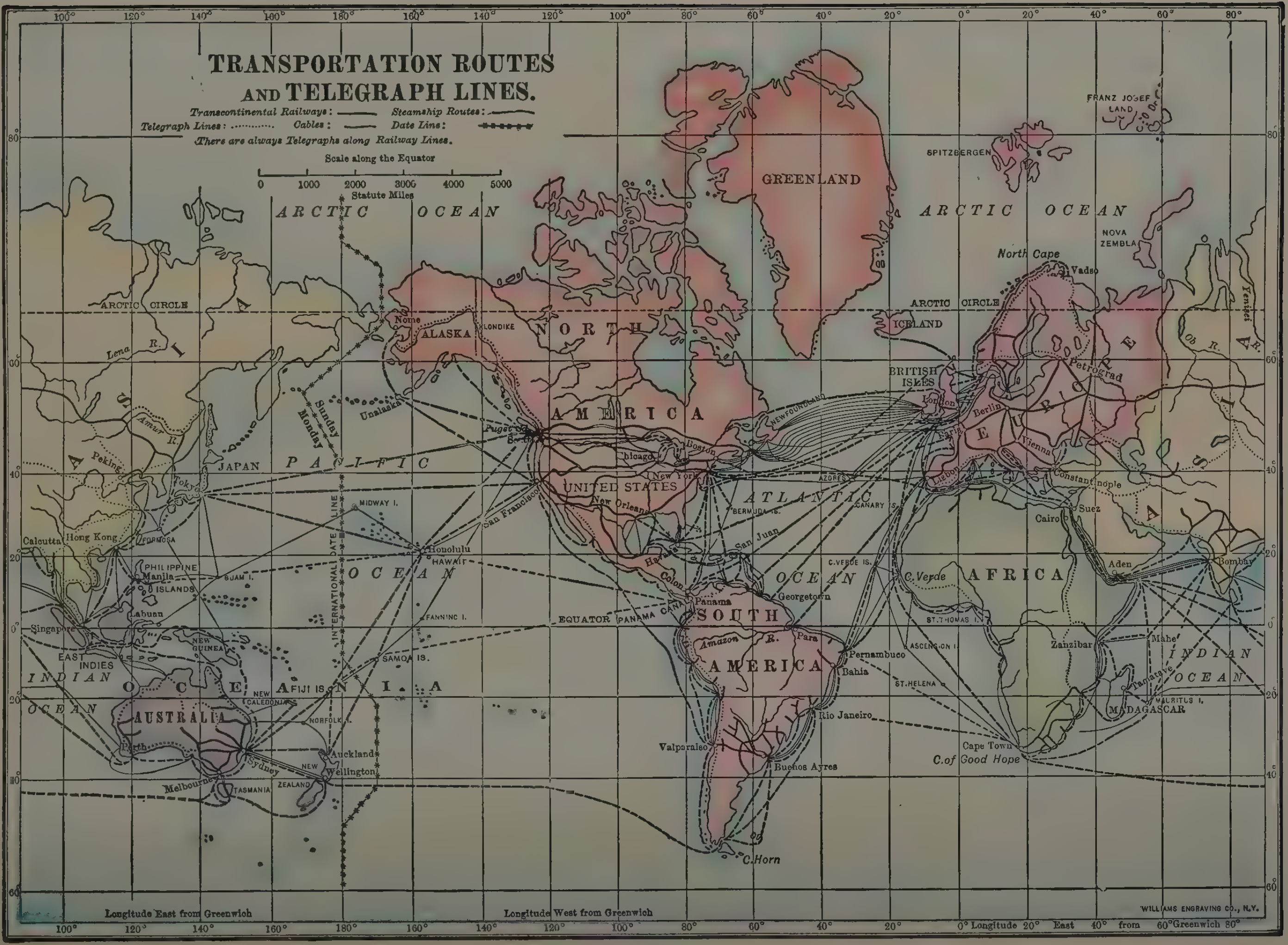

TRANSPORTATION ROUTES AND TELEGRAPH LINES.
Transcontinental Railways:
Steamship Routes:
Telegraph Lines:
Cables:
Date Line:
There are always Telegraphs along Railway Lines.
Scale along the Equator
0 1000 2000 3000 4000 5000
Statute Miles
ARCTIC OCEAN
PACIFIC OCEAN
ATLANTIC OCEAN
INDIAN OCEAN
ARCTIC CIRCLE
EQUATOR
INTERNATIONAL DATE LINE
Sunday
Monday
ASIA
EUROPE
AFRICA
NORTH AMERICA
SOUTH AMERICA
OCEANIA
AUSTRALIA
GREENLAND
ICELAND
SPITZBERGEN
FRANZ JOSEF LAND
NOVA ZEMBLA
BRITISH ISLES
ALASKA
KLONDIKE
UNITED STATES
JAPAN
PHILIPPINE ISLANDS
EAST INDIES
NEW GUINEA
NEW CALEDONIA
NEW ZEALAND
TASMANIA
MADAGASCAR
Nome
Unalaska
Puget Sd.
San Francisco
Chicago
Boston
New York
New Orleans
Havana
Colon
Panama
PANAMA CANAL
San Juan
BERMUDA IS.
AZORES
CANARY IS.
C. VERDE IS.
C. Verde
ST. THOMAS I.
ASCENSION I.
ST. HELENA
Georgetown
Para
Amazon R.
Pernambuco
Bahia
Rio Janeiro
Buenos Ayres
Valparaiso
C. Horn
Cape Town
C. of Good Hope
NEWFOUNDLAND
London
Paris
Berlin
Vienna
Lisbon
Constantinople
Petrograd
North Cape
Vadso
Cairo
Suez
Aden
Bombay
Zanzibar
Mahe
Tamatave
MAURITUS I.
Yenisei
Ob R.
Lena R.
Amur R.
Peking
Tokyo
Hong Kong
FORMOSA
Calcutta
Manila
Labuan
Singapore
GUAM I.
MIDWAY I.
Honolulu
HAWAII
FANNING I.
SAMOA IS.
FIJI IS.
NORFOLK I.
Auckland
Wellington
Sydney
Melbourne
Perth
Longitude East from Greenwich
Longitude West from Greenwich
0° Longitude 20° East 40° from 60° Greenwich 80°
WILLIAMS ENGRAVING CO., N.Y.

FIG. 446.

lage of the soil by hand that is common in Belgium and some other European countries.

3. Our variety of climate and surface features

The varied climate and surface features of our vast country are also favorable to us; for they guarantee a variety of products. Almost all farm products can be easily raised, and our wonderful mineral resources are, so far as we know, not equaled on any continent. It will therefore be seen that our natural resources, which have been so important in giving us our present position, promise equally well for the future.

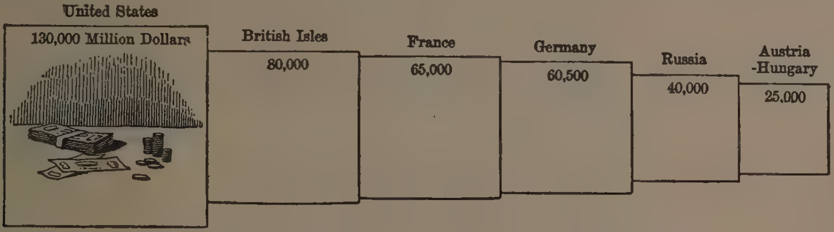


FIG. 447. — The six wealthiest nations of the world (1910).

4. The character of our people

The character of our people is another thing that must be considered in reckoning our future promise. The condition of China shows that resources alone will not make an energetic people and a great nation; for, in spite of the fact that they have been greatly favored in their resources, they have made very little use of them. Indeed, their customs have even prevented progress (p. 331).

Our people have consisted, in large part, of persons who had energy and ambition enough to migrate to a new land in the hope of bettering their condition. In their new home the opportunities have been so great that they have been encouraged to work and to improve themselves. The conditions in the desert have produced the nomad; the ease of life in the tropical forest, the shiftless savage; but the conditions in the United States have produced a race noted for its energy and enterprise. This race has been possible, however, largely because it comes from a mixture of peoples already gifted.

5 and 6. Our care for education, and our government

The statement of reasons for expecting great future progress in the United States would not be complete, if left here. There are two other factors of great importance; namely, education and government. Where people are ignorant, and where rulers hamper them by bad laws and heavy taxes, there is little chance of progress. It is those European countries in which there are the best opportunities for education, and the greatest freedom, that have made the greatest progress.

No nation in the world pays more attention to education or guarantees its people a more active part in their government than the United States. These facts, even as fully as the resources and the character of the people, help to explain our astonishing progress in the past, and to give reason for hope in the future.

APPENDIX I

TABLES OF AREA, POPULATION, ETC.

NOTE.—The figures, 1910, etc., refer to the year in which the Census was taken or the estimate was made. Most of the recent figures are obtained from the United States Census Reports of 1910 or from "The Statesman's Year Book."

SIZE OF EARTH

Length of Earth's Diameter at the Equator (miles)	7,926
Length of Equator (miles)	24,902
The Earth's Surface (square miles)	196,940,000
Total Area of Ocean (square miles)	141,486,000

CONTINENTS AND PRINCIPAL COUNTRIES, COLONIES, ETC.

	Area in Square Miles	Population
North America	**8,500,000**	**125,000,000**
Alaska, 1910	590,884	64,356
Antigua, 1911	170	38,899
Bahama Islands, 1911	5,450	55,944
Bermuda Islands, 1911	20	18,994
British Honduras, 1911	8,598	40,458
Canada, 1911	3,603,910	7,192,338
Costa Rica, 1910	18,400	379,533
Cuba, 1910	44,000	2,150,112
Greenland, 1901	46,740	11,893
Guatemala, 1910	48,290	1,992,000
Haiti (Island), 1909	10,204	2,029,700
Honduras, 1910	46,250	553,446
Jamaica, 1910	4,200	862,422
Mexico, 1910	767,005	15,063,207
Newfoundland, 1910	42,734	237,531
Labrador, 1910	120,000	4,076
Nicaragua, 1910	49,200	600,000
Panama, 1909	31,500	419,029
St. Croix, 1901	84	18,401
St. Thomas, 1901	32	11,269
Salvador, 1910	7,225	1 070,555
United States, see p. 392		
South America	**7,400,000**	**49,000,000**
Argentina, 1910	1,135,840	7,091,822
Bolivia, 1910	708,195	2,267,935
Brazil, 1908	3,218,991	21,461,100
Chile, 1910	292,580	3,329,030
Colombia, 1908	438,436	4,303,000
Ecuador, 1910 Galapagos Islands, 1910	116,000	1,500,000
Falkland Islands, 1911	5,500	2,272
Guiana, British, 1911	90,277	296,000
Guiana, Dutch, 1910	46,060	85,094
Guiana, French, 1911	30,500	49,009
Paraguay, 1910	171,204	752,000
Peru, 1910	695,733	4,000,000
South Georgia Islands	1,000	uninhabited
Tobago, 1911	114	330,074
Trinidad Island, 1911	1,754	
Uruguay, 1910	72,210	1,112,000
Venezuela, 1911	393,976	2,713,703
Europe	**3,796,000**	**392,246,000**
Albania, 1913	10,900	900,000
Andorra,	175	5,231
Austria, 1910	115,903	28,567,898
Austria-Hungary, 1910	261,100	51,323,921
Balearic Isles, 1910	1,935	325,703
Belgium, 1910	11,373	7,516,730

	Area in Square Miles	Population
British Empire, 1910	11,454,862	397,261,509
British Isles, 1910	121,390	45,469,564
Bulgaria, 1913	43,360	4,800,000
Corsica, 1906	3,367	291,160
Crete, 1900	3,365	310,185
Denmark, 1906	15,592	2,605,268
England, 1901	50,874	31,071,703
England and Wales, 1909	58,324	35,756,615
Faroe Islands, 1901	540	16,349
France, 1906	207,054	39,252,245
German Empire, 1905	208,780	60,641,278
Great Britain, 1909	88,729	40,634,263
Greece, 1913	46,600	4,600,000
Hebrides Islands	3,000	100,000
Hungary, 1900	125,430	19,254,559
Iceland, 1901	39,756	78,470
Ireland, 1909	32,360	4,374,158
Italy, 1909	110,659	34,269,746
Liechtenstein, 1906	65	9,650
Luxemburg, 1900	1,706	219,210
Malta, 1909	95	212,888
Monaco, 1909	8	19,121
Montenegro, 1913	5,600	500,000
Netherlands, 1908	12,648	5,825,198
Norway, 1908	124,130	2,352,786
Orkney Islands, 1901	376	28,699
Portugal, 1900	35,490	5,428,132
Prussia, 1905	134,616	37,293,324
Roumania, 1913	54,300	7,400,000
Russia, 1908	1,862,524	113,841,000
Russian Empire, 1908	8,647,657	155,433,300
San Marino, 1909	38	10,310
Sardinia, 1909	9,306	861,249
Scotland, 1909	30,405	4,877,648
Servia, 1913	33,600	4,300,000
Shetland Islands, 1901	551	28,166
Sicily, 1909	9,935	3,574,424
Spain, 1908	194,783	19,712,585
Sweden, 1908	172,876	5,429,600
Switzerland, 1908	15,976	3,559,349
Turkey, 1913	9.700	1,600,000
Turkish Empire, 1913	1,509,350	30,869,300
Wales, 1911	7,450	2,032,193
Asia with East Indies	**21,000,000**	**900,000,000**
Aden, 1911	75	46,165
Afghanistan, 1911	250,000	5,900,000
Arabia	1,200,000	4,825,000
Baluchistan, 1911	134,638	829,712
Bhutan, 1909	20,000	250,000

	Area in Square Miles	Population
Bokhara, 1909	83,000	1,250,000
Burma, 1911	236,738	12,115,217
Ceylon, 1911	25,332	3,592,397
China (proper), 1906	1,532,420	407,253,030
Republic of China, 1910	4,277,170	438,425,000
Chinese Turkestan, 1906	550,840	1,200,000
Cyprus, 1910	3,584	261,587
Formosa, 1910	13,458	3,123,471
French India, 1909	196	277,000
French Indo-China, 1906	256,000	16,315,063
India, 1911	1,789,154	315,132,537
Japan, 1910	147,655	50,751,919
Khiva, 1909	24,000	800,000
Korea, 1911	86,000	13,125,027
Manchuria, 1909	363,610	16,000,000
Mongolia, 1906	1,367,600	2,600,000
Nepal, 1909	54,000	5,000,000
Oman, 1909	82,000	500,000
Palestine, 1905	10,000	700,000
Persia, 1909	628,000	9,500,000
Portuguese Indies, 1901	7,330	300,000
Russia in Asia, 1910	6,207,662	24,889,000
Siam, 1909	195,000	6,686,486
Siberia, 1910	4,786,730	8,220,100
Straits Settlements, 1911	1,472	714,069
Sungaria, 1901	147,950	600,000
Tibet, 1909	463,200	6,500,000
Turkey in Asia, 1909	693,610	17,683,500
Africa	**11,000,000**	**125,000,000**
Abyssinia, 1910	432,432	5,000,000
Algeria (Fr.), 1911	343,500	5,563,828
Anglo-Egyptian Sudan, 1909	950,000	2,363,000
Angola, 1909	484,800	4,119,000
Belgian Congo, 1909	909,650	20,000,000
British Somaliland, 1910	68,000	348,000
Canary Islands (Sp.), 1910	2,807	419,809
Cape of Good Hope, 1910	276,995	2,510,000
Cape Verde Islands (Port.), 1909	1,480	147,424
Egypt, 1907	400,000	11,139,978
Eritrea (Italy), 1906	45,800	450,000
French Congo, 1907	669,280	5,000,000
French Somaliland, 1907	5,790	180,000
Gambia (Br.), 1910	3,619	160,000
German East Africa, 1909	384,180	10,000,000
German Southwest Africa, 1909	322,450	120,000
Gold Coast and Protectorate, 1910	119,200	1,500,000
Italian Somaliland, 1909	139,430	400,000
Kamerun (Ger.), 1909	191,130	3,000,000
Liberia, 1909	40,000	1,500,000– 2,100,000
Madagascar, 1911	228,000	3,054,658
Madeira Islands, 1900	314	150,574
Mauritius (Br.), 1910	835	379,184
Morocco, 1909	219,000	4,340,000– 4,580,000
Natal, 1911	35,371	1,191,958
Nigeria, Northern, 1911	256,400	9,269,000
Nigeria, Southern, 1911	77,260	7,858,689
Orange Free State, 1910	50,392	478,815
Portuguese East Africa.1901	293,400	3,120,000
Portuguese Guinea, 1901	13,940	820,000
Réunion Island (Fr.), 1907	910	201,000
St. Helena (Br.), 1911	47	3,520
Sierra Leone and Protectorate (Br.), 1910	30,000	1,100,000
Spanish Africa, 1910	85,814	235,844
Togo, 1910	33,700	1,000,000
Transvaal, 1910	110,426	1,400,000
Tripoli (Turk.), 1906	398,900	1,000,000
Tunis (Fr.), 1910	45,779	1,923,217
Uganda Protectorate, 1910	223,500	3,500,000
Zanzibar (Br.), 1910	1,020	200,000
Australia, Commonwealth of	**3,000,000**	**4,400,000**
New South Wales, 1910	310,372	1,621,677
Northern Territory, 1910	523,620	3,239
Queensland, 1910	670,500	572,654
South Australia, 1910	380,070	412,808
Tasmania, 1910	26,215	186,860
Victoria, 1911	87,884	1,315,000
Western Australia, 1911	975,920	283,986
East Indies and larger islands of the Pacific	**1,200,000**	**47,000,000**
Borneo, 1905	298,843	1,944,655
Celebes, 1905	71,470	851,905
Fiji Islands, 1910	7,740	133,831
Hawaiian Islands, 1910	6,449	191,909
Java and Madura, 1905	50,554	30,098,008
Molucca Islands, 1905	43,864	407,906
New Caledonia, 1911	7,650	55,000
New Guinea		
British Guinea, 1910	151,789	200,000
Dutch Guinea, 1905	90,540	351,603
German Guinea, 1910	95,160	356,000
New Zealand, 1910	104,751	1,048,347
Philippine Islands, 1910	115,026	8,276,802
Samoa Islands, 1910	1,079	41,140
Solomon Islands (Br.), 1910	12,000	150,310
Solomon Islands (Ger.)	4,200	
Sumatra, 1905	161,612	4,029,503
Total Area of Continents	**56,000,000**	
Total Population		**1,700,000,000**

STATES AND TERRITORIES OF THE UNITED STATES

	Area in Square Miles	Population 1900	Population 1910
Alabama	51,998	1,828,697	2,138,093
Alaska	590,884	63,592	64,356
Arizona	113,956	122,931	204,354
Arkansas	53,335	1,311,564	1,574,449
California	158,297	1,485,053	2,377,549
Colorado	103,948	539,700	799,024
Connecticut	4.965	908,420	1,114,756
Delaware	2,370	184,735	202,322
District of Columbia	70	278,718	331,069
Florida	58,666	528,542	752,619
Georgia	59,265	2,216.331	2,609,121
Guam	210	8,561	11,973
Hawaiian Islands	6.449	154,001	191,909
Idaho	84,313	161,772	325,594
Illinois	56,665	4,821,550	5,638,591
Indiana	36,354	2,516.462	2,700.876
Iowa	56,147	2,231,853	2,224,771
Kansas	82,158	1,470,495	1,690,949
Kentucky	40,598	2,147,174	2,289,905
Louisiana	48.506	1.381.625	1,656,388
Maine	33,040	694,466	742,371
Maryland	12,327	1,188,044	1,295,346
Massachusetts	8.266	2,805,346	3,366,416
Michigan	57,980	2,420,982	2,810,173
Minnesota	84,682	1,751,394	2,075,708
Mississippi	46,865	1,551,270	1,797,114
Missouri	69,420	3,106,665	3,293,335
Montana	146,572	243,329	376,053
Nebraska	77,520	1,066,300	1,192,214
Nevada	110,690	42,335	81,875
New Hampshire	9,341	411,588	430,572
New Jersey	8,224	1,883,669	2,537,167
New Mexico	122,634	195,310	327,301
New York	49,204	7,268,894	9,113,614
North Carolina	52,426	1,893,810	2,206,287
North Dakota	70,337	319,146	557,056
Ohio	41,040	4,157,545	4,767,121
Oklahoma	70,057	790,391	1,657,155
Oregon	96,699	413,536	672,765
Pennsylvania	45,126	6,302,115	7,665,111

	Area in Square Miles	Population 1900	Population 1910
Philippine Islands	127,853	7,360,551	8,276,802
Porto Rico	3,606	962,019	1,118,012
Rhode Island	1,248	428,556	542,610
South Carolina	30,989	1,340,316	1,515,400
South Dakota	77,615	401,570	583,888
Tennessee	42,022	2,020,616	2,184,789
Texas	265,896	3,048,710	3,896,542
Tutuila	77	3,800	6,780
Utah	84,990	276,749	373,351
Vermont	9,564	343,641	355,956
Virginia	42,627	1,854,184	2,061,612
Washington	69,127	518,103	1,141,990
West Virginia	24,170	958,800	1,221,119
Wisconsin	56,066	2,069,042	2,333,860
Wyoming	97,914	92,531	145,965
United States, total	**3,624,122**	**77,256,630**	**93,402,151**
United States (without Alaska, Philippine Islands, etc.)	**3,026,789**	**75,994,575**	**91,972,266**

TWENTY-FIVE OF THE LARGEST CITIES IN THE WORLD

		Population
1.	London, England, 1910	4,872,702
	Greater London, 1910	7,537,196
2.	New York, U.S., 1910	4,766,883
3.	Paris, France, 1911	2,846,986
4.	Tokyo, Japan, 1909	2,168,069
5.	Chicago, U.S., 1910	2,185,283
6.	Berlin, Germany, 1910	2,070,695
7.	Vienna, Austria-Hungary, 1911	2,004,291
8.	Petrograd, Russia, 1910	1,907,708
9.	Canton, China	1,600,000
10.	Philadelphia, U.S., 1910	1,549,008
11.	Moscow, Russia, 1907	1,359,254
12.	Buenos Aires, Argentina, 1911	1,326,994
13.	Calcutta, India, 1910	1,216,514
14.	Constantinople, Turkey	1,125,000
15.	Osaka, Japan, 1908	1,117,151
16.	Shanghai, China	1,000,000
17.	Tientsin, China, 1910	1,000,000
18.	Rio de Janeiro, Brazil, 1909	1,000,000
19.	Bombay, India, 1910	972,892
20.	Hamburg, Germany, 1910	936,000
21.	Liverpool, England, 1910	767,606
22.	Glasgow, Scotland, 1909	872,021
23.	Warsaw, Russia, 1901	756,426
24.	Budapest, Austria-Hungary, 1901	732,322
25.	Barcelona, Spain, 1911	700,000

TWENTY-FIVE LARGEST CITIES IN THE UNITED STATES

		Population 1900	Population 1910
1.	New York, N.Y.	3,437,202	4,766,883
2.	Chicago, Ill.	1,698,575	2,185,283
3.	Philadelphia, Pa.	1,293,697	1,549,008
4.	St. Louis, Mo.	575,238	687,029
5.	Boston, Mass.	560,892	670,585
6.	Cleveland, Ohio	381,768	560,663
7.	Baltimore, Md.	508,957	558,485
8.	Pittsburgh, Pa.	321,616	533,905
9.	Detroit, Mich.	285,704	465,766
10.	Buffalo, N.Y.	352,387	423,715
11.	San Francisco, Cal.	342,782	416,912
12.	Milwaukee, Wis.	285,315	373,857
13.	Cincinnati, Ohio.	325,902	364,463
14.	Newark, N.J.	246,070	347,469
15.	New Orleans, La.	287,104	339,075
16.	Washington, D.C.	278,718	331,069
17.	Los Angeles, Cal.	102,479	319,198
18.	Minneapolis, Minn.	202,718	301,408
19.	Jersey City, N.J.	206,433	267,779
20.	Kansas City, Mo.	163,752	248,381
21.	Seattle, Wash.	80,671	237,194
22.	Indianapolis, Ind.	169,164	233,650
23.	Providence, R.I.	175,597	224,326
24.	Louisville, Ky.	204,731	223,928
25.	Rochester, N.Y.	162,608	218,146

GROWTH OF THE FIFTEEN LARGEST CITIES OF THE COUNTRY

	City	1800	1830	1890	1900	1910
1.	New York, N.Y.	60,489 (1)	197,112 (1)	2,507,414 (1)	3,437,202 (1)	4,766,883
2.	Chicago, Ill.	—	4,470 (1840)	1,099,850 (2)	1,698,575 (2)	2,185,283
3.	Philadelphia, Pa.	41,220 (2)	80,462 (3)	1,046,964 (3)	1,293,697 (3)	1,549,008
4.	St. Louis, Mo.	10,049 (1820)	14,125 (7)	451,770 (4)	575,238 (4)	687,029
5.	Boston, Mass.	24,937 (4)	61,392 (4)	448,477 (5)	560,892 (5)	670,585
6.	Cleveland, Ohio.	606 (1820)	1,076 (12)	261,353 (9)	381,768 (7)	560,663
7.	Baltimore, Md.	26,514 (3)	80,620 (2)	434,439 (6)	508,957 (6)	558,485
8.	Pittsburgh, Pa.	1,565 (5)	12,568 (8)	238,617 (12)	321,616 (11)	533,905
9.	Detroit, Mich.	1,422 (1820)	2,222 (11)	205,876 (13)	285,704 (13)	465,766
10.	Buffalo, N.Y.	2,095 (1820)	8,668 (10)	255,664 (10)	352,387 (8)	423,715
11.	San Francisco, Cal.	—	—	298,997 (7)	342,782 (9)	416,912
12.	Milwaukee, Wis.	—	1,172 (1840)	204,468 (14)	285,315 (14)	373,857
13.	Cincinnati, Ohio.	2,540 (1810)	24,831 (6)	296,908 (8)	325,902 (10)	364,463
14.	Newark, N.J.	8,008 (1810)	10,953 (9)	181,830 (15)	246,070 (15)	347,469
15.	New Orleans, La.	17,242 (1810)	29,737 (5)	242,039 (11)	287,104 (12)	339,075

CITIES OF THE UNITED STATES WITH 25,000 OR MORE INHABITANTS IN 1910; AND A FEW OTHERS, MOSTLY MENTIONED IN THE BOOK

	Population, 1900	Population, 1910
Akron, Ohio	42,728	69,067
Albany, N.Y.	94,151	100,253
Albuquerque, N.M.	6,238	11,020
Allentown, Pa.	35,416	51,913
Altoona, Pa.	38,973	52,127
Amsterdam, N.Y.	20,929	31,267
Anaconda, Mont.	9,453	10,134
Annapolis, Md.	8,575	8,609
Ann Arbor, Mich.	14,509	14,817
Asheville, N.C.	14,694	18,762
Ashland, Wis.	13,074	11,594
Astoria, Ore.	8,381	9,599
Atchison, Kan.	15,722	16,429
Atlanta, Ga.	89,872	154,839
Atlantic City, N.J.	27,838	46,150
Auburn, Me.	12,951	15,064
Auburn, N.Y.	30,345	34,668
Augusta, Ga.	39,441	41,040
Augusta, Me.	11,683	13,211
Aurora, Ill.	24,147	29,807

	Population, 1900	Population, 1910
Austin, Tex.	22,258	29,860
Baltimore, Md.	508,957	558,485
Bangor, Me.	21,850	24,803
Barre, Vt.	8,448	10,734
Bath, Me	10,477	9,396
Baton Rouge, La.	11,269	14,897
Battle Creek, Mich.	18,563	25,267
Bay City, Mich.	40,747	45,166
Bayonne, N.J.	32,722	55,545
Bellingham, Wash.	11,062	24,296
Berkeley, Cal.	13,214	40,434
Biddeford, Me.	16,145	17,079
Billings, Mont.	3,221	10,031
Binghamton, N.Y.	39,647	48,443
Birmingham, Ala.	38,415	132,685
Bisbee, Ariz.	7,000	9,019
Bismarck, N.D.	3,319	5,443
Bloomington, Ill.	23,286	25,768
Boise, Idaho	5,957	17,358
Boston, Mass.	560,892	670,585
Bradford, Pa.	15,029	14,544
Bridgeport, Conn.	70,996	102,054
Brockton, Mass.	40,063	56,878
Brookline, Mass.	19,935	27,792
Brunswick, Ga.	9,081	10,182
Buffalo, N.Y.	352,387	423,715
Burlington, Vt.	18,640	20,463
Butte, Mont.	30,470	39,165
Cambridge, Mass.	91,886	104,839
Camden, N.J.	75,935	94,538
Canton, Ohio	30,667	50,217
Carson City, Nev.	2,100	2,466
Cedar Rapids, Iowa	25,656	32,811
Champaign, Ill.	9,098	12,421
Charleston, S.C.	55,807	58,833
Charleston, W. Va.	11,099	22,996
Charlotte, N.C.	18,091	34,014
Chattanooga, Tenn.	30,154	44,604
Chelsea, Mass.	34,072	32,452
Chester, Pa.	33,988	38,537
Cheyenne, Wyo.	14,087	11,320
Chicago, Ill.	1,698,575	2,185,283
Chicopee, Mass.	19,167	25,401
Cincinnati, Ohio	325,902	364,463
Clarksville, Tenn.	9,431	8,548
Cleveland, Ohio	381,768	560,663
Clinton, Iowa	22,698	25,577
Colorado Springs, Colo.	21,085	29,078
Columbia, S.C.	21,108	26,319
Columbus, Ga.	17,614	20,554
Columbus, Ohio	125,560	181,548
Concord, N.H.	19,632	21,497
Council Bluffs, Iowa	25,802	29,292
Covington, Ky.	42,938	53,270
Cripple Creek, Colo.	10,147	6,206
Dallas, Tex.	42,638	92,104
Danville, Ill.	16,354	27,871
Danville, Va.	16,520	19,020
Davenport, Iowa	35,254	43,028
Dayton, Ohio	85,333	116,577
Decatur, Ill.	20,754	31,140
Denver, Colo.	133,859	213,381
Des Moines, Iowa	62,139	86,368
Detroit, Mich.	285,704	465,766
Douglas, Ariz.	——	6,437
Dover, Del.	3,329	3,720
Dover, N.H.	13,207	13,247
Dubuque, Iowa	36,297	38,494
Duluth, Minn.	52,969	78,466
Durham, N.C.	6,679	18,241
Easton, Pa.	25,238	28,523
East Orange, N.J.	21,506	34,371
Eastport, Me.	5,311	4,961
East St. Louis, Ill.	29,655	58,547
Elgin, Ill.	22,433	25,976
Elizabeth, N.J.	52,130	73,409
Elmira, N.Y.	35,672	37,176
El Paso, Tex.	15,906	39,279
Erie, Pa.	52,733	66.525
Evanston, Ill.	19,259	24,978
Evansville, Ind.	59,007	69,647
Everett, Mass.	24,336	33,484
Fall River, Mass.	104,863	119,295
Fargo, N.D.	9,589	14,331
Findlay, Ohio	17,613	14,858
Fitchburg, Mass.	31,531	37,826
Flint, Mich.	13,103	38,550
Fort Wayne, Ind.	45,115	63,933
Fort Worth, Tex.	26,688	73,312
Frankfort, Ky.	9,487	10,465
Fresno, Cal.	12,470	24,892
Galveston, Tex.	37,789	36,981
Gloucester, Mass.	26,121	24,398
Goldfield, Nev.	——	4,838
Grand Rapids, Mich.	87,565	112,571
Greeley, Colo.	3,023	8,179
Green Bay, Wis.	18,684	25,236
Greenville, S.C.	11,860	15,741
Guthrie, Ok.	10,006	11,654
Hamilton, Ohio	23,914	35,279
Harrisburg, Pa.	50,167	64,186
Hartford, Conn.	79,850	98,915
Haverhill, Mass.	37,175	44,115
Hazelton, Pa.	14,230	25,452
Helena, Mont.	10,770	12,515
High Point, N.C.	4,163	9,525
Hilo, Hawaiian Islands	19,785	6,745
Hoboken, N.J.	59,364	70,324
Holyoke, Mass.	45,712	57,730
Honolulu, Hawaiian Islands	39,306	52,183
Hot Springs, Ark.	9,973	14,434
Houghton, Mich.	3,595	5,113
Houston, Tex.	44,633	78,800
Huntington, W. Va.	11,923	31,161
Huntsville, Ala.	8,068	7,611
Indianapolis, Ind.	169,164	233,650
Ishpeming, Mich.	13,255	12,448
Ithaca, N.Y.	13,136	14,802
Jackson, Mich.	25,180	31,433
Jackson, Miss.	7,816	21,262
Jacksonville, Fla.	28,429	57,699
Jamestown, N.Y.	22,892	31,297
Jefferson City, Mo.	9,664	11,850
Jersey City, N.J.	206,433	267,779
Johnstown, Pa.	35,936	55,482
Joliet, Ill.	29,353	34,670
Joplin, Mo.	26,023	32,073
Juneau, Alaska	1,864	1,644
Kalamazoo, Mich.	24,404	39,437
Kansas City, Kan.	51,418	82,331
Kansas City, Mo.	163,752	248,381
Key West, Fla.	17,114	19,945
Kingston, N.Y.	24,535	25,908
Knoxville, Tenn.	32,637	36,346
La Crosse, Wis.	28,895	30,417
Lancaster, Pa.	41,459	47,227
Lansing, Mich.	16,485	31,229
Laramie, Wyo.	8,207	8,237
Lawrence, Mass.	62,559	85,892
Leadville, Colo.	12,455	7,508
Lewiston, Idaho	2,425	6,043
Lewiston, Me.	23,761	26,247
Lexington, Ky.	26,369	35,099
Lima, Ohio	21,723	30,508
Lincoln, Neb.	40,169	43,973
Little Rock, Ark.	38,307	45,941
Lockport, N.Y.	16,581	17,970
Lorain, Ohio	16,028	28,883
Los Angeles, Cal.	127,927	319,198
Louisville, Ky.	204,731	223,928
Lowell, Mass.	94,969	106,294
Lynchburg, Va.	18,891	29,494
Lynn, Mass.	68,513	89,336
Macon, Ga.	23,272	40,665
Madison, Wis.	19,164	25,531
Malden, Mass.	33,664	44,404
Manchester, N.H.	56,987	70,063
Manila, Philippines, 1903	219,928	——
Marquette, Mich.	10,058	11,503
McKeesport, Pa.	34,227	42,694

	Population, 1900	Population, 1910
Memphis, Tenn.	102,320	131,105
Meriden, Conn.	24,296	27,265
Miami, Fla.	1,681	5,471
Milwaukee, Wis.	285,315	373,857
Minneapolis, Minn.	202,718	301,408
Mobile, Ala.	38,469	51,521
Montgomery, Ala.	30,346	38,136
Montpelier, Vt.	6,266	7,856
Mount Vernon, N.Y.	21,228	30,919
Muskogee, Okla.	4,254	25,278
Nashua, N.H.	23,898	26,005
Nashville, Tenn.	80,865	110,364
Natchez, Miss.	12,210	11,791
Newark, N.J.	246,070	347,469
Newark, Ohio	18,157	25,404
New Bedford, Mass.	62,442	96,652
New Britain, Conn.	25,998	43,916
Newburgh, N.Y.	24,943	27,805
Newcastle, Pa.	28,339	36,280
New Haven, Conn.	108,027	133,605
New Orleans, La.	287,104	339,075
Newport, Ky.	28,301	30,309
Newport, R.I.	22,441	27,149
Newport News, Va.	19,635	20,205
New Rochelle, N.Y.	14,720	28,867
Newton, Mass.	33,587	39,806
New York, N.Y.	3,437,202	4,766,883
Niagara Falls, N.Y.	19,457	30,445
Nome City, Alaska	12,486	2,600
Norfolk, Va.	46,624	67,452
Norristown, Pa.	22,265	27,875
North Yakima, Wash.	3,154	14,082
Oakland, Cal.	66,960	150,174
Ogden, Utah	16,313	25,580
Oil City, Pa.	13,264	15,657
Oklahoma City, Okla.	10,037	64,205
Olean, N.Y.	9,462	14,743
Olympia, Wash.	4,082	6,996
Omaha, Neb.	102,555	124,096
Orange, N.J.	24,141	29,630
Oshkosh, Wis.	28,284	33,062
Oswego, N.Y.	22,199	23,368
Pasadena, Cal.	9,117	30,291
Passaic, N.J.	27,777	54,773
Paterson, N.J.	105,171	125,600
Pawtucket, R.I.	39,231	51,622
Pensacola, Fla.	17,747	22,982
Peoria, Ill.	56,100	66,950
Perth Amboy, N.J.	17,690	32,121
Petersburg, Va.	21,810	24,147
Philadelphia, Pa.	1,293,697	1,549,008
Phœnix, Ariz.	5,544	11,134
Pierre, S.D.	2,306	3,656
Pittsburgh, Pa.	321,616	533,905
Pittsfield, Mass.	21,766	32,121
Plymouth, Mass.	9,562	12,141
Pomona, Cal.	5,526	10,207
Ponce, Porto Rico, 1899	27,952	35,027
Portland, Me.	50,145	58,571
Portland, Ore.	90,426	207,214
Portsmouth, N.H.	10,637	11,269
Portsmouth, Va.	17,427	33,190
Poughkeepsie, N.Y.	24,029	27,936
Prescott, Ariz.	3,559	5,092
Providence, R.I.	175,597	224,326
Provincetown, Mass., 1895	4,555	4,369
Pueblo, Colo.	28,157	44,395
Quincy, Ill.	36,252	36,587
Quincy, Mass.	23,899	32,642
Racine, Wis.	29,102	38,002
Raleigh, N.C.	13,643	19,218
Reading, Pa.	78,961	96,071
Redlands, Cal.	4,797	10,449
Richmond, Va.	85,050	127,628
Riverside, Cal.	7,978	15,212
Roanoke, Va.	21,495	34,874
Rochester, N.Y.	162,608	218,149
Rockford, Ill.	31,051	45,401
Rome, Ga.	7,291	12,099
Rutland, Vt.	11,499	13,546

	Population, 1900	Population, 1910
Sacramento, Cal.	29,282	44,696
Saginaw, Mich.	42,345	50,510
St. Augustine, Fla.	4,272	5,494
St. Joseph, Mo.	102,979	77,403
St. Louis, Mo.	575,238	687,029
St. Paul, Minn.	163,065	214,744
Salem, Mass.	35,956	43,697
Salem, Ore.	4,258	14,094
Salt Lake City, Utah	53,531	92,777
San Antonio, Tex.	53,321	96,614
San Bernardino, Cal.	6,150	12,779
San Diego, Cal.	17,700	39,578
San Francisco, Cal.	342,782	416,912
San José, Cal.	21,500	28,946
San Juan, Porto Rico, 1899	32,048	48,716
Santa Fé, N.M.	5,603	5,072
Sault Ste. Marie, Mich.	10,538	12,615
Savannah, Ga.	54,244	65,064
Schenectady, N.Y.	31,682	72,826
Scranton, Pa.	102,026	129,867
Seattle, Wash.	80,671	237,194
Shawnee. Okla.	3,464	12,474
Sheboygan, Wis.	22,962	26,398
Shenandoah, Pa.	20,321	25,774
Shreveport, La.	16,013	28,015
Sioux City, Iowa	33,111	47,828
Sioux Falls, S.D.	10,266	14,094
Sitka, Alaska	1,396	1,039
Skagway, Alaska	3,117	872
Somerville, Mass.	61,643	77,236
South Bend, Ind.	35,999	53,684
South Omaha, Neb.	26,001	26,259
Spartanburg, S.C.	11,395	17,519
Spokane, Wash.	36,848	104,402
Springfield, Ill.	34,159	51,678
Springfield, Mass.	62,059	88,926
Springfield, Mo.	23,267	35,201
Springfield, Ohio	38,253	46,921
Stamford, Conn.	15,997	25,138
Stockton, Cal.	17,506	23,253
Superior, Wis.	31,091	40,384
Syracuse, N.Y.	108,374	137,249
Tacoma, Wash.	37,714	83,743
Tallahassee, Fla.	2;981	5,018
Tampa, Fla.	15,839	37,782
Taunton, Mass.	31,036	34,259
Terre Haute, Ind.	36,673	58,157
Toledo, Ohio	131,822	168,497
Tonopah, Nev.	——	3,900
Topeka, Kan.	33,608	43,684
Trenton, N.J.	73,307	96,815
Troy, N.Y.	60,651	76,813
Tucson, Ariz.	7,521	13,193
Utica, N.Y.	56,383	74,419
Vicksburg, Miss.	14,834	20,814
Virginia City, Nev.	2,695	2,244
Waco, Tex.	20,686	26,425
Walla Walla, Wash.	10,049	19,363
Waltham, Mass.	23,481	27,834
Warwick, R.I.	21,316	26,629
Washington, D.C.	278,718	331,069
Waterbury, Conn.	45,859	73,141
Waterloo, Iowa	12,580	26,693
Watertown, N.Y.	21,696	26,730
Waterville, Me.	9,477	11,458
West Hoboken, N.J.	23,094	35,403
Wheeling. W. Va.	38,878	41,641
Wichita, Kan.	24,671	52,450
Wilkes Barre. Pa.	51,721	67,105
Williamsport, Pa.	28,757	31,860
Wilmington, Del.	76,508	87,411
Wilmington, N.C.	20,976	25,748
Winona, Minn.	19,714	18,583
Woonsocket, R.I.	28,204	38,125
Worcester, Mass.	118,421	145,986
Yonkers, N.Y.	47,931	79,803
York, Pa.	33,708	44,750
Youngstown, Ohio	44,885	79,066
Zanesville, Ohio	23,538	28,026

FOREIGN CITIES MOST OF WHICH ARE MENTIONED IN THE TEXT

	Population
Aachen, Germany, 1910	156,044
Abeokuta, Niger Territory	150,000
Aberdeen, Scotland, 1911	163,084
Acapulco, Mexico	5,000
Adelaide, Australia, 1910	192,000
Adis Ababa, Abyssinia	30,000–35,000
Alexandria, Egypt, 1907	332,246
Algiers, Algeria, 1906	138,240
Amsterdam, Netherlands, 1910	573,983
Antwerp, Belgium, 1910	320,640
Archangel, Russia, 1911	35,000
Arequipa, Peru, 1908	35,000-40,000
Asuncion, Paraguay, 1910	84,000
Athens, Greece, 1907	167,479
Auckland, New Zealand, 1911	102,676
Bagdad, Turkey in Asia	75,000
Bahia, Brazil, 1909	230,000
Baku, Russia, 1904	177,777
Ballarat, Australia, 1910	44,000
Bangkok, Siam, 1909	628,675
Barcelona, Spain, 1911	700,000
Barmen, Germany, 1910	169,201
Basel, Switzerland, 1910	131,914
Batavia, Java, 1905	138,551
Belfast, Ireland, 1910	391,167
Belgrade, Servia, 1910	84,235
Benares, India, 1911	203,804
Bendigo, Australia, 1911	42,000
Berbera, Br. Somaliland	30,000
Bergen, Norway, 1910	76,917
Berlin, Germany, 1910	2,070,695
Berne, Switzerland, 1910	85,264
Bilbao, Spain, 1910	92,514
Birmingham, England, 1910	570,113
Bloemfontein, South Africa, 1911	14,760
Bogota, Colombia, 1910	290,000
Bologna, Italy, 1911	173,639
Bombay, India, 1910	972,892
Bordeaux, France, 1911	261,678
Bradford, England, 1910	295,865
Bremen, Germany, 1910	246,827
Breslau, Germany, 1910	511,891
Brindisi, Italy, 1907	22,021
Brisbane, Australia, 1909	143,077
Bristol, England, 1910	382,550
Brussels, Belgium, 1910	665,806
Bucharest, Roumania, 1908	300,000
Budapest, Austria-Hungary, 1910	880,371
Buenos Aires, Argentina, 1911	1,326,994
Cadiz, Spain, 1910	67,174
Cairo, Egypt, 1907	654,476
Calcutta, India, 1911	1,216,514
Calgary, Canada, 1911	44,000
Callao, Peru, 1908	31,000
Cambridge, England, 1905	38,760
Canton, China	1,600,000
Cape Town, Cape of Good Hope, 1911	67,000
Caracas, Venezuela	72,429
Cardiff, Wales, 1910	199,189
Cartagena, Colombia, 1910	27,000
Cartagena, Spain, 1910	96,983
Catania, Italy, 1911	211,699
Cayenne, French Guiana, 1910	12,426
Cettinje, Montenegro, 1906	4,500
Chemnitz, Germany, 1910	287,807
Christchurch, New Zealand, 1911	80,193
Christiania, Norway, 1910	243,801
Cologne, Germany, 1910	516,167
Colon, Panama, 1910	19,300
Constantinople, Turkey	1,125,000
Copenhagen, Denmark, 1911	462,161
Cordoba, Argentina, 1911	70,880
Cordoba, Spain, 1910	65,160
Cork, Ireland, 1911	76,632
Cuzco, Peru, 1908	10,000–15,000
Damascus, Turkey in Asia	250,000
Danzig, Germany, 1910	170,347
Dawson, Canada, 1901	9,142
Delhi, India, 1911	232,837
Dover, England, 1905	43,734
Dresden, Germany, 1910	546,882
Dublin, Ireland, 1910	402,928
Dundee, Scotland, 1911	165,006
Dunedin, New Zealand, 1911	64,237
Durban, Natal, 1911	31,896
Edinburgh, Scotland, 1911	320,315
Elberfeld, Germany, 1910	170,118
Essen, Germany, 1910	294,629
Fez, Morocco, 1910	140,000
Fiume, Austria-Hungary, 1910	49,806
Florence, Italy, 1911	999,405
Frankfort, Germany, 1910	414,598
Fredericton, Canada, 1901	7,117
Freetown, Sierra Leone, 1910	37,682
Fuchau, China, 1909	624,000
Geneva, Switzerland, 1910	125,520
Genoa, Italy, 1911	272,077
Georgetown, British Guiana, 1908	53,176
Ghent, Belgium, 1910	164,659
Gibraltar, Spanish Pen., 1909	25,915
Glasgow, Scotland, 1910	784,455
Gothenburg, Sweden, 1910	167,813
Granada, Spain, 1910	74,283
Grimsby, England, 1910	74,283
Guatemala, Guatemala, 1910	90,000
Guayaquil, Ecuador, 1910	80,000
Hague, The, Netherlands, 1910	280,515
Halifax, Canada, 1911	46,000
Halle, Germany, 1910	180,551
Hamburg, Germany, 1910	936,000
Hamilton, Bermuda, 1907	2,246
Hamilton, Canada, 1911	82,000
Hammerfest, Norway	2,239
Hangchau, China, 1909	350,000
Hankau, China, 1909	820,000
Hanover, Germany, 1910	302,384
Havana, Cuba, 1910	319,884
Havre, France, 1911	136,159
Hebron, Holy Land	18,000–19,000
Helsingfors, Russia, 1908	137,346
Hobart, Tasmania, 1911	27,719
Hongkong, China, 1908	329,650
Hué, French Ind. China, 1910	50,000
Hull, England, 1909	275,552
Hyderabad, India, 1911	500,623
Iquique, Chile, 1907	40,171
Irkutsk, Siberia, 1908	108,060
Jaffa, Holy Land	45,000
Jerusalem, Holy Land, 1910	70,000
Johannesburg, Transvaal, 1910	158,580
Kabul, Afghanistan	60,000
Khartum, Egyptian Sudan, 1909	20,956
Khelat, Baluchistan	14,000
Kiev, Russia, 1909	468,712
Kimberley, Cape of Good Hope, 1911	13,656
Kingston, Canada	17,961
Kingston, Jamaica, 1911	57,379
Kioto, Japan, 1908	442,462
Königsberg, Germany, 1910	245,853
Krefeld, Germany, 1910	129,412
Kumassi, Ashanti, 1910	7,000
La Guaira, Venezuela	8,000
La Paz, Bolivia, 1909	78,856
La Plata, Argentina, 1911	100,608
Lassa, Tibet	15,000–20,000
Leeds, England, 1910	490,985
Leghorn, Italy, 1908	108,000
Leicester, England, 1910	248,374
Leipzig, Germany, 1910	587,635

	Population
Leith, Scotland, 1911	80,489
Libreville, French Congo	8,000
Liege, Belgium, 1910	174,768
Lille, France, 1911	217,807
Lima, Peru, 1908	140,884
Limoges, France, 1911	92,181
Lisbon, Portugal, 1900	356,009
Liverpool, England, 1910	767,606
Loanda, Port. W. Africa	14,000
Lodz, Russia, 1908	393,526
London, Canada, 1911	46,000
London, England, 1910	4,872,702
London, Greater, 1910	7,537,196
Lourenço Marquez, Port. E. Africa, 1908	9,849
Lucerne, Switzerland, 1910	39,152
Lucknow, India, 1911	259,798
Lyon, France, 1911	523,796
Madras, India, 1911	518,660
Madrid, Spain, 1910	571,539
Magdeburg, Germany, 1910	279,685
Malaga, Spain, 1910	133,045
Manaos, Brazil, 1909	50,000
Manchester, England, 1910	716,854
Mandalay, Burma, 1910	138,299
Marseille, France, 1911	550,619
Maskat, Oman, 1907	25,000
Mecca, Turkey	80,000
Melbourne, Australia, 1910	591,830
Messina, Italy, 1911	126,172
Metz, Germany, 1910	68,667
Mexico City, Mexico, 1910	470,659
Milan, Italy, 1911	599,200
Mocha, Turkey in Asia	5,000
Mombasa, Br. E. Africa, 1910	30,000
Monrovia, Liberia, 1908	8,000
Montevideo, Uruguay, 1909	291,465
Montreal, Canada, 1911	466,000
Morocco, Morocco	50,000
Moscow, Russia, 1909	1,481,200
Munich, Germany, 1910	595,053
Nogoya, Japan, 1908	378,231
Naples, Italy, 1911	723,208
Nassau, Bahama, 1910	12,534
Nazareth, Holy Land	11,000
Newcastle, England, 1911	266,671
Nice, France, 1911	142,940
Nizhni Novgorod, Russia, 1904	92,273
Nottingham, England, 1910	266,471
Nuremberg, Germany, 1910	332,651
Odessa, Russia, 1909	478,900
Oporto, Portugal, 1900	167,955
Osaka, Japan, 1908	1,226,590
Ottawa, Canada, 1911	86,000
Oxford, England, 1910	53,220
Palermo, Italy, 1911	314,656
Panama, Panama, 1909	40,801
Para, Brazil	65,000
Paramaribo, Dutch Guiana, 1909	34,795
Paris, France, 1911	2,846,986
Peking, China	1,600,000
Pernambuco, Brazil, 1906	150,000
Perth, West Australia, 1908	54,354
Peterborough, Canada, 1901	11,239
Petrograd Russia, 1910	1,907,708
Pietermaritzburg, Natal, 1911	30,539
Piræus, Greece, 1907	73,579
Pisa, Italy, 1911	65,215
Port Arthur, Canada, 1901	3,214
Port Arthur, China	——
Port au Prince, Haiti, 1908	100,000
Port Said, Egypt, 1907	49,884
Portsmouth, England, 1910	217,989
Posen, Germany, 1910	156,696
Potsdam, Germany, 1910	62,224
Prague, Austria-Hungary, 1910	223,741
Pretoria, Transvaal, 1910	48,609
Puebla, Mexico, 1910	101,214
Quebec, Canada, 1910	78,000
Queenstown, Ireland	9,082
Quito, Ecuador, 1909	70,000
Rangoon, Burma, 1911	289,432
Rheims, France, 1911	115,178
Riga, Russia, 1908	318,400
Rio de Janeiro, Brazil, 1909	1,000,000
Rome, Italy, 1911	538,634
Rosario, Argentina, 1909	176,076
Rotterdam, Netherlands, 1909	417,780
Roubaix, France, 1906	121,017
Rouen, France, 1906	118,459
St. Etienne, France, 1906	146,788
St. John, Canada, 1911	42,000
St. John's, Newfoundland, 1911	31,501
Samarkand, Russian Turkestan, 1905	66,166
San Luis Potosi, Mexico, 1910	82,946
San Salvador, Salvador, 1906	59,540
Santiago, Chile, 1907	332,724
Santo Domingo, Santo Domingo, 1909	18,626
Santos, Brazil, 1909	35,000
São Paulo, Brazil, 1909	400,000
Seoul, Korea, 1911	278,958
Seville, Spain, 1910	155,366
Sèvres, France	6,902
Shanghai, China	1,000,000
Sheffield, England, 1910	478,763
Siangtan, China, 1908	1,000,000
Singanfu, China, 1908	1,000,000
Singapore, Straits Settlements, 1911	311,985
Smyrna, Turkey, 1910	350,000
Sofia, Bulgaria, 1910	102,769
Southampton, England, 1910	127,157
Stettin, Germany, 1910	236,145
Stockholm, Sweden, 1910	341,986
Strassburg, Germany, 1910	178,290
Stuttgart, Germany, 1910	285,589
Suchau, China, 1908	500,000
Sucre, Bolivia, 1909	23,416
Suez, Egypt, 1910	18,347
Swansea, Wales, 1910	98,817
Sydney, Australia, 1910	621,100
Tampico, Mexico	9,885
Tananarivo, Madagascar, 1909	94,810
Tangier, Morocco, 1901	35,003
Tashkend, Russian Turkestan, 1904	164,740
Teheran, Persia, 1905	280,009
Tiberias, Holy Land, 1905	5,000
Tientsin, China, 1910	1,000,000
Tiflis, Russia, 1904	196,935
Timbuktu, Sudan	20,000
Tokyo, Japan, 1908	2,186,079
Toronto, Canada, 1911	376,000
Trebizond, Turkey in Asia	51,000
Trieste, Austria-Hungary, 1910	229,475
Tripoli, Tripoli, 1909	30,000
Trondhjem, Norway, 1910	45,228
Tunis, Tunis, 1906	227,519
Turin, Italy, 1911	427,733
Upernivik, Greenland	700
Valencia, Spain, 1910	233,348
Valparaiso, Chile, 1907	162,447
Vancouver, Canada, 1911	100,000
Venice, Italy, 1911	160,727
Vera Cruz, Mexico, 1910	29,164
Versailles, France, 1911	60,458
Victoria, Canada, 1911	32,000
Vienna, Austria-Hungary, 1911	2,004,291
Vladivostok, Siberia, 1909	90,162
Warsaw, Russia, 1909	781,179
Wellington, New Zealand, 1911	70,729
West Ham, England, 1910	328,585
Windsor, Canada, 1901	12,158
Winnipeg, Canada, 1911	135,000
Wuchang, China	300,000
Yakoba, Niger Terr.	50,000
Yarmouth, Canada, 1901	6,420
Yokohama, Japan, 1908	394,303
Zanzibar (British), 1910	35,262
Zurich, Switzerland, 1910	189,088

ELEVATION OF SOME PLATEAUS AND MOUNTAIN PEAKS

	Feet
Abyssinian Plateau	5-7,000
Aconcagua, Andes, Argentina (highest in South America)	22,860
Apo, Mindanao, Philippines	10,312
Ararat, Turkey in Asia	17,325
Mt. Blanc, Alps, France (highest in Alps)	15,781
Bolivian Plateau	10–13,000
Brazilian Plateau	2–2,500
Chimborazo, Andes, Ecuador	20,493
Cotopaxi, Andes, Ecuador	19,613
Elbruz, Caucasus, Russia	18,200
Etna, Sicily	10,835
Everest, Himalayas, Nepal (highest known in the world)	29,002
Fremont Peak, Rocky Mountains, Wyo.	13,790
Fujiyama, Japan	12,365
Hecla, Iceland	5,110
Kunchinjunga	28,156
Kenia, Africa	18,620
Kilimanjaro, Africa (highest known in Africa)	19,780
Kosciusko, Australia (highest in Australia)	7,336
Logan, Coast Ranges, Canada (highest known in Canada)	19,539
McKinley, Alaska (highest known in North America)	20,464
Mauna Kea, Hawaiian Islands	13,805
Mauna Loa, Hawaiian Islands	13,675
Mayon, Luzon Island, Philippines	8,900
Mexican Plateau	5–6,000
Mitchell, Appalachian Mts., N.C. (highest in Eastern U.S.)	6,711
Mt. Marcy, New York	5,344
Mt. Tina, Haiti	10,300
Orizaba, Mexico (highest in Mexico)	18,314
Pico del Turquino, Cuba	8,600
Pike's Peak, Rocky Mountains, Colorado	14,111
Popocatepetl, Mexico	17,798
Rainier, Cascade Mountains, Washington	14,363
St. Elias, Alaska	18,025
San Francisco Mountain, Arizona	12,794
Shasta, Cascade Mountains, California	14,380
Tibet Plateau	10–15,000
United States, Western Plateau	5–6,000
Vesuvius, Italy	4,200
Washington, White Mountains, N.H. (highest in Northeastern U.S.)	6,279
Whitney, Sierra Nevada, California (highest in Western U.S.)	14,502
Yunque, Porto Rico	3,609

SOME OF THE LARGEST RIVERS OF THE WORLD

	Length in Miles	Basin Area Sq. Miles	Ocean
North America			
Arkansas	2,170	185,671	Atlantic
Colorado	2,000	225,049	Pacific
Columbia	1,400	216,537	Pacific
Mackenzie	2,000	590,000	Arctic
Missouri	3,000	527,155	Atlantic
Missouri-Mississippi	4,300	1,257,000	Atlantic
Nelson	1,732	432,000	Atlantic
Ohio	975	201,720	Atlantic
Rio Grande	1,800	240,000	Atlantic
St. Lawrence	2,200	530,000	Atlantic
Yukon	2,000	440,000	Pacific
South America			
Amazon	3,300	2,500,000	Atlantic
Orinoco	1,350	366,000	Atlantic
Plata	2,580	1,200,000	Atlantic
São Francisco	1,800	200,000	Atlantic
Europe			
Danube	1,770	300,000	Atlantic
Dneiper	1,200	242,000	Atlantic
Dwina	1,000	140,000	Arctic
Elbe	725	55,000	Atlantic
Po	400	27,000	Atlantic
Rhine	800	75,000	Atlantic
Rhone	500	38,000	Atlantic
Seine	482	30,300	Atlantic
Thames	228	6,100	Atlantic
Volga	2,400	563,300	Caspian
Asia			
Amur	2,800	520,000	Pacific
Brahmaputra	1,800	425,000	Indian
Ganges	1,500	440,000	Indian
Hoang-ho	2,700	570,000	Pacific
Indus	1,800	372,700	Indian
Irawadi	1,500	158,000	Indian
Lena	2,800	950,000	Arctic
Mekong	2,800	280,000	Pacific
Ob	3,200	1,000,000	Arctic
Yangtse-kiang	3,200	548,000	Pacific
Yenisei	3,000	1,500,000	Arctic
Africa			
Congo	2,900	1,200,000	Atlantic
Niger	2,600	563,300	Atlantic
Nile	3,400	1,273,000	Atlantic
Zambezi	1,500	600,000	Indian
Australia			
Darling	1,100	——	Indian
Murray	1,000	270,000	Indian

SOME OF THE LARGE LAKES OF THE WORLD

	Area in Sq. Miles	Elevation in Feet	Greatest Depth in Feet
Aral Sea	26,900	160	225
Baikal	12,500	1,312	4,550
Balkash	7,800	780	70
Caspian	169,000	— 85[1]	2,400
Chad, variable with season	10,000 and often more	800–900	12
Dead Sea	870	— 1,310[1]	1,330
Erie	9,990	573	210
Great Bear Lake	11,200	200	——
Great Salt Lake	2,360	4,218	30–50
Great Slave Lake	10,100	——	over 650
Huron	22,322	582	750
Ladoga	7,000	60	730
Manitoba	1,850	810	——
Michigan	21,729	582	870
Nicaragua	3,600	110	83
Nyassa	14,000	1,500	600 +
Ontario	7,104	247	738
Superior	30,829	602	1,008
Tanganyika	12,650	2,800	2,100
Titicaca	3,300	12,875	700
Victoria Nyanza	30,000	4,000	590 +
Winnipeg	9,400	710	70

[1] Below sea level.

DISTRIBUTION OF MANKIND

Mongolians	**540,000,000**
China	380,000,000
Japan and Korea	55,000,000
Indo-China	35,000,000
Malaysia	30,000,000
Other Mongolians	40,000,000
Caucasians	**770,000,000**
Europe	355,000,000
Asia	280,000,000
America	115,000,000
Africa	15,000,000
Australasia	5,000,000

DISTRIBUTION OF MANKIND

Ethiopians	**173,000,000**
Africa and Madagascar	153,000,000
North and South America	20,000,000
American Indians	**22,170,000**
Mexico	8,765,000
Brazil	4,200,000
Colombia	3,150,000
Peru	2,700,000
Bolivia, Guatemala, and Venezuela	4,225,000
United States	250,000
Canada	100,000

RELIGIONS OF MANKIND

Buddhists and Brahmins	650,000,000
Christians	440,000,000
Jews	8,000,000
Mohammedans	180,000,000
Pagans and others	250,000,000

PRINCIPAL COUNTRIES FROM WHICH THE FOREIGN-BORN POPULATION OF THE UNITED STATES HAS COME

Country of Birth	Number in 1910
Austria-Hungary	258,737
Italy	215,537
Russian Empire	186,792
British North America	56,555
England	46,706
German Empire	31,288
Ireland	29,855
Greece	25,888
Sweden	28,745
Scotland	20,115

DISTRIBUTION OF NEGROES IN THE FIFTEEN STATES WHERE THEY ARE MOST NUMEROUS

	States	Number of Negroes in 1900	Percentage of Negroes to Total Population, 1900
1.	Georgia	1,034,813	46.69
2.	Mississippi	907,630	58.50
3.	Alabama	827,307	45.24
4.	South Carolina	782,321	58.36
5.	Virginia	660,722	35.63
6.	Louisiana	650,804	47.10
7.	North Carolina	624,469	32.97
8.	Texas	620,722	20.36
9.	Tennessee	480,243	23.77
10.	Arkansas	366,856	27.97
11.	Kentucky	284,706	13.25
12.	Maryland	235,064	19.75
13.	Florida	230,730	43.65
14.	Missouri	161,234	5.18
15.	Pennsylvania	156,845	2.48

Total number of Negroes in 1900, 8,840,789.

INDEX AND PRONOUNCING VOCABULARY

KEY TO PRONUNCIATION

(Webster's International Dictionary)

ā, as in āle; ā̍, as in sen′ā̍te; â, as in câre; ă, as in ăm; ä, as in ärm; ȧ, as in ȧsk; *a*, as in fi′n*a*l; a̤, as in a̤ll; ē, as in ēve; ē̍, as in ē̍-vent′; ĕ, as in ĕnd; ẽ, as in fẽrn; *e*, as in re′cent; ī, as in īce; ī̍, as in ī̍-de′a; ĭ, as in ĭll; ō, as in ōld; ō̍, as in ō̍-bey′; ô, as in ôrb; ŏ, as in ŏdd; ū, as in ūse; ū̍, as in ū̍-nite′; ṳ, as in rṳde; ụ, as in fụll; ŭ, as in ŭp; û, as in ûrn; y̆, as in pit′y̆; ōō, as in fōōd; ŏŏ, as in fŏŏt; ou, as in out; oi, as in oil; ɴ, representing simply the nasal tone of the preceding vowel, as in ensemble (äɴ′säɴ′b'l), ' (for voice glide), as in pardon (pär′d'n); g (hard), as in go; s (sharp), as in so; z (like s sonant), as in zone; ch (= tsh), as in chair; sh, for ch, as in machine; zh (= sh made sonant), for z, as in azure; j (= dzh), for g, as in gem; k, for ch, as in chorus; kw, for qu, as in queen; ks (surd), for x, as in vex; gz (sonant), for x, as in exist; f, for ph, as in philosophy; hw, for wh, as in what; t, for ed, as in baked; ng, as in long; n̲ (like ng), for n before the sound of k or hard g, as in bank; n (ordinary sound), as in no; t̶h (sonant), for th, as in then; th (surd), as in thin.

The primary accent is indicated by a short, heavy mark (′), the secondary by a lighter mark (′).

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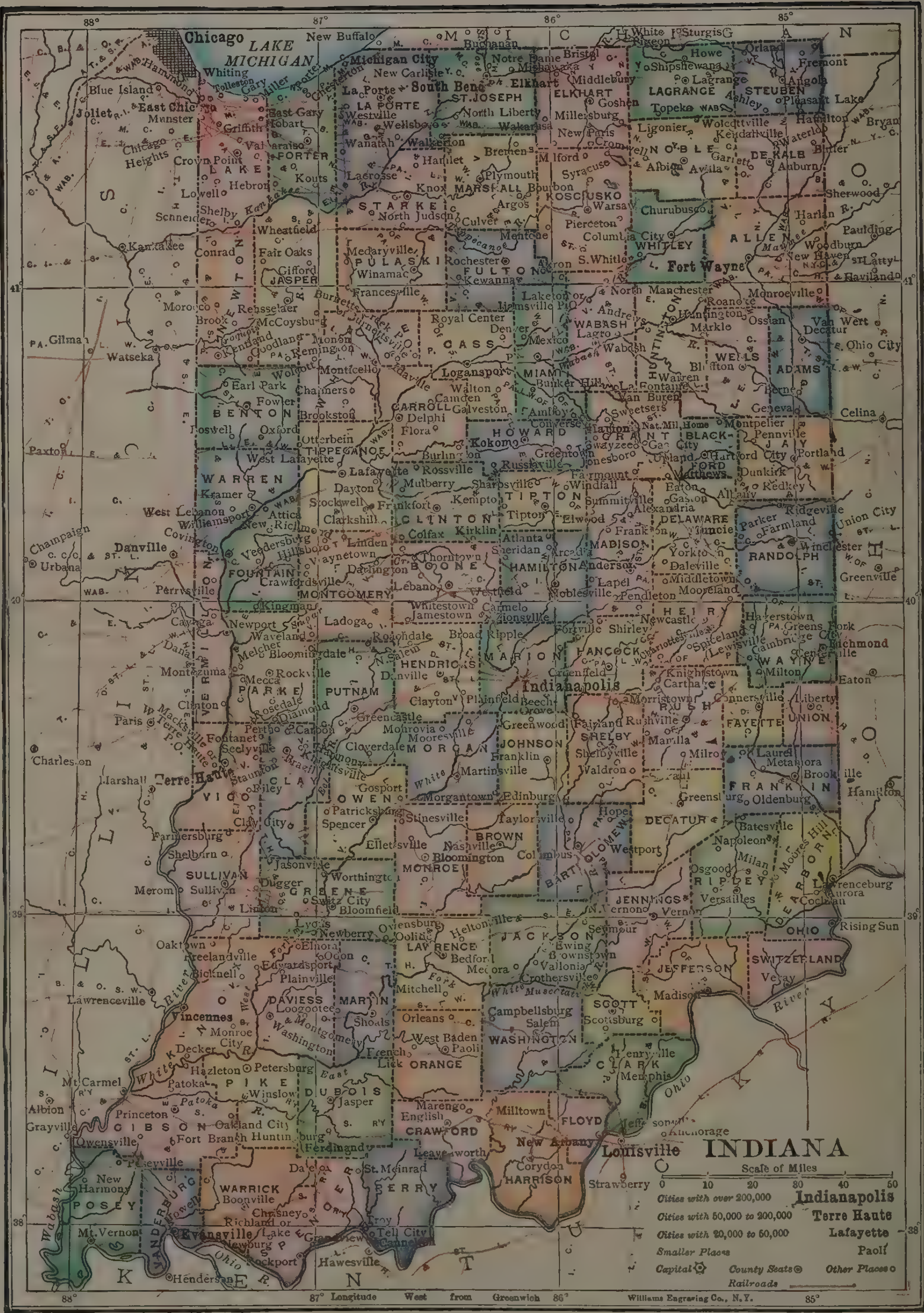
INDIANA
Scale of Miles
0 10 20 30 40 50
Cities with over 200,000 Indianapolis
Cities with 50,000 to 200,000 Terre Haute
Cities with 20,000 to 50,000 Lafayette
Smaller Places Paoli
Capital
County Seats
Other Places
Railroads
Williams Engraving Co., N.Y.
Longitude West from Greenwich
88°
87°
86°
85°
41°
40°
39°
38°
LAKE MICHIGAN
Chicago
Louisville
Evansville
Fort Wayne
South Bend
Indianapolis
Terre Haute
Lafayette
Vincennes
New Albany
Kokomo
Logansport
Muncie
Richmond
Anderson
Elkhart
LAKE
PORTER
LA PORTE
ST. JOSEPH
ELKHART
LAGRANGE
STEUBEN
NOBLE
DE KALB
STARKE
MARSHALL
KOSCIUSKO
WHITLEY
ALLEN
NEWTON
JASPER
PULASKI
FULTON
CASS
MIAMI
WABASH
HUNTINGTON
WELLS
ADAMS
BENTON
WHITE
CARROLL
HOWARD
GRANT
BLACKFORD
JAY
WARREN
TIPPECANOE
CLINTON
TIPTON
MADISON
DELAWARE
RANDOLPH
FOUNTAIN
MONTGOMERY
BOONE
HAMILTON
HENRY
WAYNE
VERMILLION
PARKE
PUTNAM
HENDRICKS
MARION
HANCOCK
RUSH
FAYETTE
UNION
VIGO
CLAY
OWEN
MORGAN
JOHNSON
SHELBY
DECATUR
FRANKLIN
SULLIVAN
GREENE
MONROE
BROWN
BARTHOLOMEW
JENNINGS
RIPLEY
DEARBORN
OHIO
SWITZERLAND
KNOX
DAVIESS
MARTIN
LAWRENCE
JACKSON
JEFFERSON
SCOTT
WASHINGTON
ORANGE
CLARK
PIKE
DUBOIS
CRAWFORD
FLOYD
HARRISON
GIBSON
POSEY
VANDERBURG
WARRICK
SPENCER
PERRY
MICHIGAN
OHIO
ILLINOIS
KENTUCKY
Wabash R.
Ohio R.
White R.
Kankakee R.

TARR AND McMURRY'S NEW COMPLETE GEOGRAPHY

INDIANA SUPPLEMENT

BY

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HIGH SCHOOL, BLOOMINGTON, INDIANA

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INDIANA SUPPLEMENT

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I. MAP STUDY

1. Draw an outline map of the state. 2. Indicate upon it the rivers, the cities, and the railroads. 3. Bound the state. 4. Name the natural boundaries and the artificial ones. 5. Name the large cities of the United States that lie east and west of Indiana. 6. Describe the course of the Ohio River. 7. What are its important tributaries from Indiana? 8. What important cities are located on the Ohio? 9. Is there a wide plain on the Indiana side of the Ohio? 10. Describe the course of the Wabash River. 11. Name its important tributaries from the south, the east, and from the north. 12. Is the Wabash a navigable stream? If so, how far? 13. Name the larger cities of the Wabash beginning at Bluffton and proceeding westward. 14. What channel of commerce formerly followed the Wabash River from Huntington to Terre Haute? 15. Trace the West Fork of White River. 16. What cities, if any, are located on it? 17. Trace the East Fork. 18. What cities, if any, are there on it? 19. Are the valleys of these rivers fertile? 20. Locate the Kankakee River. 21. In St. Joseph county, of what stream does the Kankakee seem to be a continuation? 22. What part of the state drains into Lake Erie? 23. By what rivers is this area drained? 24. Name at least six railroads that cross the state in a general easterly and westerly direction. 25. Name those that run north and south. 26. How do they compare in number with the east-west roads? 27. What is the largest railroad center? 28. Name the great cities with which it is directly connected. 29. What are the most important lake and river ports in Indiana?

II. THE NORTHWEST TERRITORY AND INDIANA

The boundaries

After the Revolutionary War, the northern states of the thirteen colonies gave to the general government territory lying to their west, bounded by the Mississippi on the west, the Ohio River on the south, and the Great Lakes on the north. This land was known as the Northwest Territory. Five states, Ohio, Indiana, Illinois, Michigan, and Wisconsin, were afterwards formed from this territory. Indiana lies between 37° 47′ and 41° 50′ north latitude and 84° 49′ and 88° 2′ west longitude. Part of its boundaries, the Ohio and the Wabash rivers and Lake Michigan, are natural. The eastern boundary is the meridian running north from the mouth of the Big Miami; the meridian forming the western boundary is the meridian of Vincennes from the point where this meridian crosses the Wabash River north of that city. The northern parallel is ten miles north of the southern end of Lake Michigan and was chosen in order that Indiana might have a lake outlet. The boundary follows the middle of the Wabash River between Indiana and Illinois and the low-water mark on the north side of the Ohio River between Indiana and Kentucky.

The area

The state is rather irregular in shape. It contains 36,350 square miles, 440 square miles of which are water area. It is nearly 280 miles long at its greatest length north and south.

Review questions and suggestions

1. Compare the state in size with Ohio; with Pennsylvania; with the New England States combined. 2. Show how the Maumee, the Wabash, the Kankakee, and the Ohio rivers were of use to the early explorers and settlers. 3. Name and trace the Kentucky tributaries of the Ohio and show how these tributaries helped people from the south to come to southern Indiana.

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III. HISTORY

The French period

It is believed that LaSalle, the French Jesuit, visited Indiana in 1669. His exploration was the beginning of a considerable movement of the French into the territory. They established trading posts at Fort Miami, near Fort Wayne (about 1710), at Ouiatenon (1720) on the Wabash River five miles below Lafayette, at Vincennes (about 1727). Vincennes is the only one of these posts that became a permanent settlement. This period of exploration had little permanent effect. The French have left some geographic names, such as Vincennes, Terre Haute, Laporte, St. Joseph, St. Mary's, and the one settlement at Vincennes by which to remember the period. With the fall of Quebec and Montreal during the French and Indian War, the French gave up Canada. Since the St. Lawrence and the Great Lakes had been the route by which the French had gained entrance to the Northwest Territory and the Mississippi valley, the withdrawal of this nation from Canada led to their withdrawal in a few years from the Territory and the Great Valley.

The site of old Fort Wayne.

The English period

The Indians had found the French very companionable. Because of this, they gave the English much difficulty during the first two years of their rule. The chief Indian trouble centered around Chief Pontiac. After taking all the forts west of the Alleghany Mountains except Pittsburgh, he gave up the struggle in 1765. The great number of settlers going into the Northwest Territory led the English to be jealous of their colonists, and they tried various ways of curbing this growth. A law called the Quebec Act was passed by Parliament which seemed to indicate this. Then, too, the English made allies of the Indians and incited them to attack the settlers.

In order to control the Indians and the British, George Rogers Clark of Virginia raised a small force of men and marched to Kaskaskia on the Mississippi. After taking this post, he turned to Vincennes and captured it. These conquests of Clark led to what is called the Virginia period.

The Virginia period

By 1784, Virginia, along with the other colonies claiming parts of the Northwest Territory, ceded it to the general government. Three years later Congress planned the government of the territory in the Ordinance of 1787. In 1798, a territorial government was established over the territory, and, a few years later, the territory began to be subdivided. In an early division Indiana was the part west of the Cincinnati meridian. Later Indiana was reduced to its present size. In 1816 the territorial government was supplanted by a state government.

The early settlers in this territory moved west from their homes in the East. Those who settled in the northern part of Indiana were for the most part from the northern colonies, and the South supplied most of the settlers for the southern part. There were, however, in every part settlers from every colony.

Courtesy of Mr. Adolph Melzer.

First State Capitol at Corydon.

The waterways along which the settlers traveled, especially the Ohio and its southern tributaries, helped to keep the settlers from the South in the southern part of the territory.

Early routes of travel

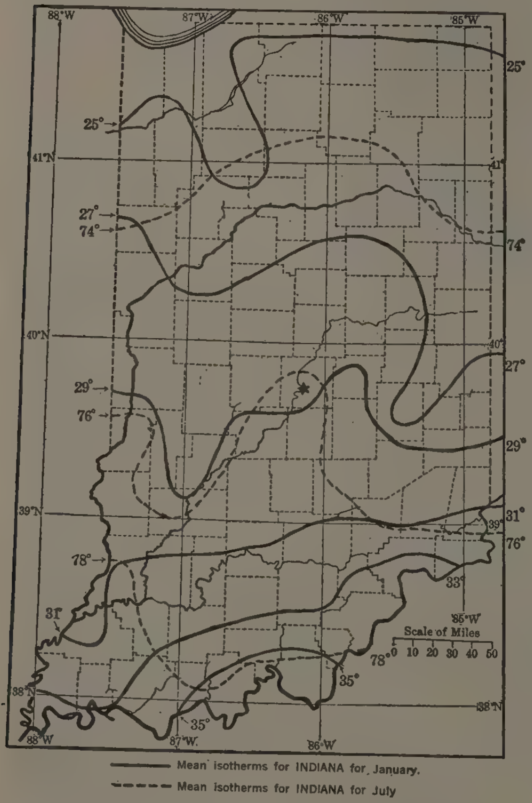
The position of Indiana with its long axis north and south has made it a state crossed by nearly all immigrants to the west. The French explorers followed its streams. From the Mississippi, they came up the Illinois River, then across to Lake Michigan or up the Kankakee to the region of the bend of the St. Joseph River near South Bend. They portaged across to the latter river and reached Lake Michigan by a second route. From Erie they came up the Maumee to the present site of Fort Wayne, portaged across country to the Wabash, and followed this stream to the Ohio and the Mississippi. They could also portage across from Lake Erie to the present site of Pittsburgh and follow the Ohio down. Later this route and the Maumee-Wabash valley routes were much used by prospective settlers. Virginians and Carolinians who crossed the Appalachian Mountains found rivers that always led them north. The Kanawha, the Kentucky, and the Green rivers all led them north to the Ohio. Through this fact, the southern part of the state was settled largely by southern people. When the Wabash and Erie Canal was built, an easy grade was found across from the Maumee valley to the Wabash valley, which it followed for 350 miles. This put Indiana in much closer touch with

Looking up the Wabash-Maumee River channel southwest of Fort Wayne.

the East and led a great stream of settlers west.

Review questions and suggestions

1. Read in your history about the explorations of LaSalle and report on them to the class. 2. When was the earliest settlement made in your city or county? 3. Who made it? 4. Read (in your history) of the conquests of George Rogers Clark and make a report.



Isothermal map of Indiana, showing the mean isotherms for January and July. These isothermal lines connect places having the same temperature.

5. Who were some of the prominent personages in early Indiana history? 6. What is the origin of some of the names of Indiana counties and county-seats? 7. What is the origin of the names of your own county and county-seat? 8. How many nationalities are indicated by these names? 9. Make an outline map of the state and surrounding territory. Indicate upon the map the historical places that are mentioned here.

IV. CLIMATE

The effect of latitude

1. The growing season

The most important influence on the climate of Indiana is the range of latitude. The state stretches from 37° 47′ to 41° 50′ north latitude, a distance of about 280 miles from north to south. This range of latitude, although it does not make marked differences, does make noticeable differences in the length of season, the average temperature, and the amount of rainfall between the northern and the southern sections of the state. The average July temperature for Evansville in the southern part of the state is 79.3°; for Auburn in the northern part, it is 72.2°. Between the average temperatures of these two places for January there is a difference of 8°. Frosts come much earlier in the fall and later in spring in the north than in the south. The long summer days and the high temperature which result from the more direct rays of the sun and the long periods of sunshine combine to make Indiana a fine corn state. Practically all cereal and fruit crops are likewise benefited.

2. Rainfall

Rainfall is well distributed through all months of the year and especially during the months of the growing season. There are, however, two or three dry years out of every eleven to thirteen years, especially in the south and central parts of the state. During these dry years the total rainfall is often not more than two-thirds of that for normal years. This causes shortage in crops when the dry months occur during the growing season.

Winds and storms

In the central and the northern parts of the United States the prevailing winds are from the west. Indiana lies in this belt of westerly winds. West and southwest winds are common over the state at all seasons and during the winter months northwest and west winds are the rule. The storms that pass over the state are great whirls of air. They change the direction of the wind so that one time it comes from one direction; and another time, another direction; but these storms move at the same time eastward across the state. Thunder storms are common, especially during the summer months. They are generally accompanied by rain. Snow falls in winter in all sections of the state. In the southern section the fall is light but in the northern part the annual snowfall is about four feet.

Elevation

The surface of the state is not so uneven that the climate is much affected by elevation. There are no mountains. The highest point is about 800 feet higher than the lowest point. More than three-fourths of the surface lies in a fairly level plain between 500 and 1000 feet high. From this we may see that the altitude is practically nothing and so its effect on climate is almost nothing when compared with the effects that the high altitude of mountains have on the climate.

Continental climate

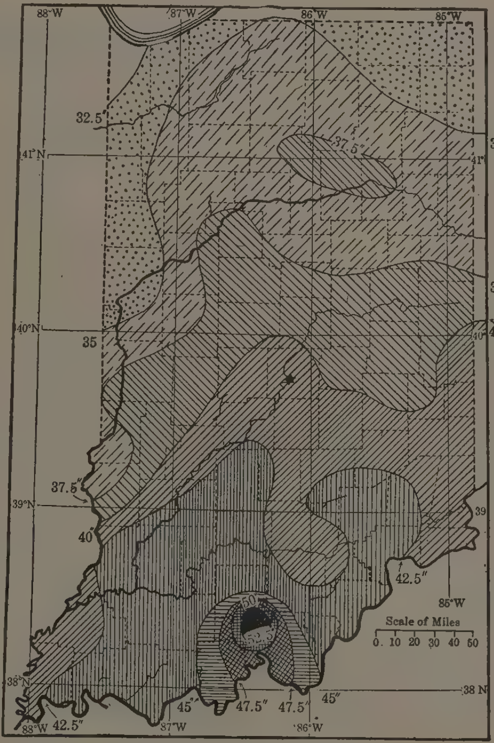
Most of the state has what is called a continental climate, for, with the exception of a small section in the northwestern part of the state which lies near Lake Michigan, its climate is not influenced by the presence of large bodies of water. So at all seasons the temperature is subject to rapid changes and storms occur frequently. In summer 110 degrees has been recorded in southern Indiana and 20 degrees below zero is not uncommon in the northern part of the state.

Influence of Lake Michigan

Lake Michigan, as we have said, influences the climate in the northwestern part. This may be seen in the fact that at Angola frost is a week earlier in autumn and three days later in spring than it is at Hammond. Could this be due to latitude? Is it not due to the modifying influence that Lake Michigan has on the climate?

Review questions and suggestions

1. What influences most prominently the climate of Indiana? 2. Show how latitude affects the growing season of plants. 3. During summer what is the most common wind direction in Indiana? 4. What direction is more prevalent during the winter? 5. When a cold wave comes, from what direction is the wind? 6. From where do the storms that give us the heaviest rains usually come? 7. Is Indiana affected very much by differences of altitude? 8. Is fruit grown more on the eastern side of Lake Michigan or on the western side? Why? 9. Why should Hammond have frost so much later than Angola? 10. Northern Indiana has eight inches less rain per year than southern Indiana. Is the rain of the northern part sufficient for crops? 11. How do farmers

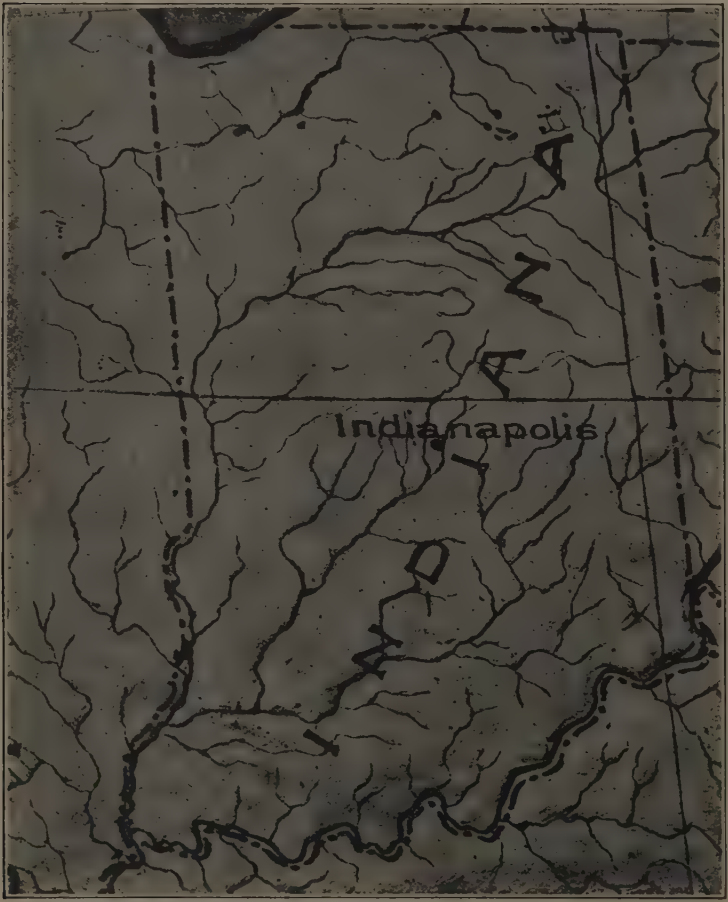


RAINFALL MAP OF INDIANA

Legend.

☐ Less than 32.5 in. per year	▥ 42.5 - 45 in. per year
⠿ 32.5 - 35 in. per year	▤ 45 - 47.5 in. per year
▨ 35 - 37.5 in. per year	▨ 47.5 - 50 in. per year
▧ 37.5 - 40 in. per year	▦ 50 - 52.5 in. per year
▨ 40 - 42.5 in. per year	■ 52.5 - 55 in. per year

avoid injury by drought to corn, potatoes, and other cultivated crops? 12. Keep a record of the weather, telling the temperature and the general character of the day. 13. Review the directions for keeping the weather record, found in the Introductory Geography, page 29. 14. Keep a weather record for the various months of the school year.



Relief map of Indiana, showing surface features and drainage.

V. DRAINAGE

The rivers that drain the state belong either to the St. Lawrence or the Mississippi, the two great river systems.

Rivers of the St. Lawrence system

Two small sections are drained into the St. Lawrence River. Allen County and parts of the adjoining counties drain through the Maumee into Lake Erie. Elkhart and St. Joseph counties drain through the St. Joseph of the Lake into Lake Michigan. Trace the course of each of these rivers. Tell where they rise and into what each river flows.

Rivers of the Mississippi system

1. Wabash

The Wabash with its tributaries, a part of the Mississippi system, drains two-thirds of the state. This river flows in and across Indiana for more than 400 miles. Its valley differs greatly in width. It is narrowest east of Huntington, deepest from Huntington to Delphi and widest southwest of Delphi. Its valley is extremely fertile, and is subject to floods, especially from Terre Haute to its mouth.

The principal tributaries of the Wabash are the Eel and Tippecanoe from the north; the Salamonie, Mississinewa, and White from the south. Of these the White is the largest. With its two branches it drains a large area in the central part of the state.

2. The Ohio

While the Ohio is only a boundary and drains directly but a small area of the state, it has had much to do with the growth of the state. It furnished one of the roadways by which the explorers and early settlers reached Indiana. Later, after settlements were made, it furnished an outlet for the products of the farms to New Orleans. As the demand for coal grew, the upper Ohio was the carrier for coal. Thousands of tons are still shipped to Indiana river ports and from these distributed by rail. Since the cutting away of so many of the forests in its basin, the Ohio is subject to flood and low water. The river is frequently so low as to hinder commerce greatly. Falls in the river at Louisville were formerly a hindrance to through vessels, but a canal running around the falls now takes care of this difficulty. It now carries on one of the heaviest activities in commerce of the rivers in the United States. The Ohio, like the Wabash, is a very crooked stream and, from Madison to Jeffersonville, it is very picturesque.

3. Other rivers

The Kankakee drains a part of the northwest group of counties through the Illinois into the Mississippi. The White Water River drains a small section in the southeast directly into the Ohio.

Water power

With the present decrease in the amount of wood and natural gas and the certain future decrease in the amount of petroleum and coal, the question of power for heating, lighting, and manufacturing is an important one. One of the sources from which much power must be obtained in the future is water power.

In northern and central Indiana, the rivers flow in shallow valleys and generally have but little grade. This makes it necessary to build dams in order to secure sufficient fall. In the soft drift, sites for such construction work are hard to find. Furthermore, the building of dams across shallow-valleyed rivers increases the liability to floods above the dams and would also back water over much valuable land. For these reasons, water power is not easy to obtain in the northern and central parts of the state. In the Wabash valley from Huntington to Delphi, where this river and its tributaries cross rather hard limestone, the tributaries have sunk valleys into the rocks and there water power may be obtained. The largest developments of water power in the state are in the St. Joseph and Elkhart rivers near South Bend and Elkhart.

© *Shaw and Cosner.*

Lower Falls, Eel River.

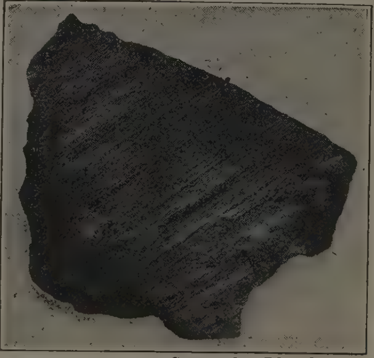
In southern Indiana many power sites have been found, but few of them have been developed. The valleys are deeper, the

Hen Island power plant and dam, near Mishawaka.

grades are higher, and the sides of the valleys furnish good holds for the anchorage of dams. In the extreme southwest, the grades are too low to furnish power. The largest power plant in this section is at Williams, Indiana.

Questions

1. Are there any old water mills in your vicinity? 2. For what was the power used? 3. Are these mills still used? Why? 4. What is meant by a portage? 5. Locate the portages found in Indiana. 6. How many drainage basins are found in the state? 7. Compare them in size. 8. Make a drainage map of Indiana and draw a line along each divide. 9. Why is the Wabash valley deepest from Huntington to Delphi? 10. What is the character of the country along the Kankakee river? 11. Name the ways in which water power may be used. 12. What is meant by an hyrdo-electric power plant?


Courtesy Mr. Edward Barrett.

Showing the effect of glacial action on the rocks.

VI. GEOLOGY

The rocks

Indiana, in common with the entire Mississippi valley, was for long ages covered by the sea. This was for such a long period of time that the corals and many other much smaller animals living in this ocean, built up beds of limestone hundreds of feet thick. The sands brought to this ocean were slowly built into great beds of sandstone; and the fine clay, like that which makes the river water muddy, settled in the ocean and made the great beds of shale. That these kinds of rocks are at least a mile thick in Indiana proves the great length of time that Indiana was sea bottom.

The coal

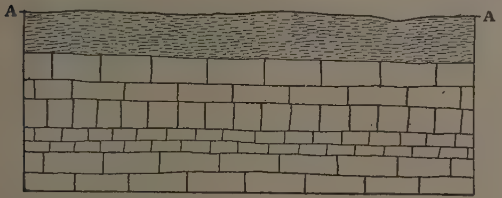
On the swampy ocean shores, great fern trees and other plants grew so plentifully that, after falling into the water, they have produced the immense coal beds of southwestern Indiana and of the other coal-producing states of the Mississippi valley.

The dry land

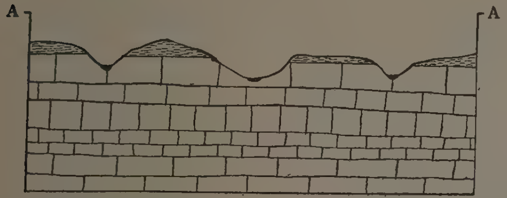
About the close of the age during which the coal was formed, the sea bottom was uplifted so much that it became dry land. Fig. (1). Rivers were then slowly formed over the whole region. The rivers began to dig valleys and form tributaries. These dug valleys of their own and the still smaller streams flowing into them brought in the soils and decayed rocks from the higher points until the whole area was worn down to a lower level, but was left much rougher than at first. Fig. (2).

The great glaciers

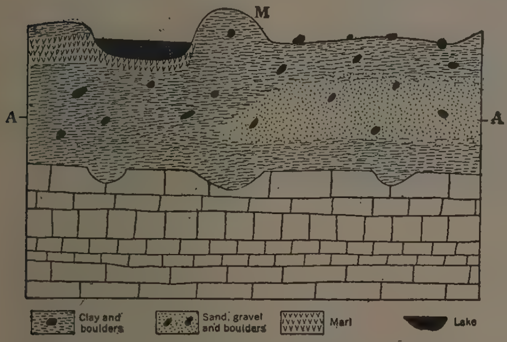
The next great event in the geology of the state, so far as we who live in the state are concerned, was the coming of the great glaciers. This period is called the Ice Age or the Glacial Age. During this age, there came from Labrador and from the region west of Hudson Bay great masses of ice pushing out over southern Canada and the northern United States. In the thousands of years that it probably took the ice to come down over southern Canada and northern United States, it cut down the hills and mountains that lay across its path and filled up the river valleys. At the same time it brought great quantities of soil, clay, sand, and gravel, and innumerable numbers of bowlders of all sizes. It destroyed the plant and animal life of the region over which it passed. It sometimes found beds of soft rock on the surface and dug these out, leaving basins in the surface. When finally the ice began to melt or retreat, it left the load of soil, which it carried, and spread it over the surface where it may be seen to-day in the northern and central parts of the state. From the map it may be seen that about five-sixths of Indiana was covered by this ice sheet.



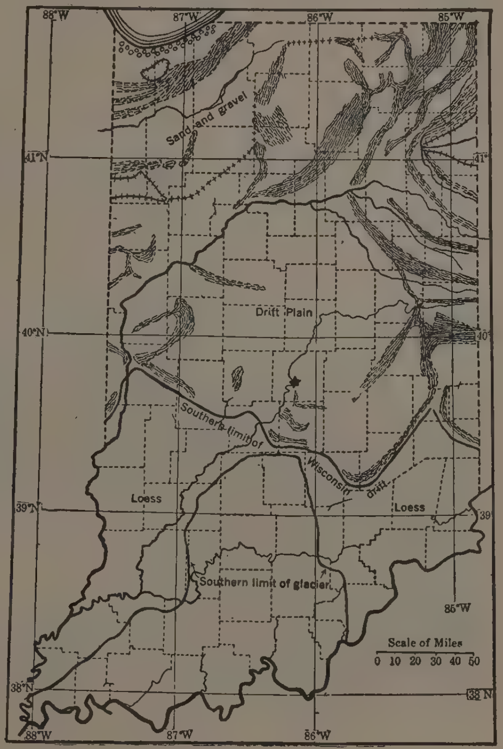
(1) A section of uplifted sea bottom. The lower part is of stratified rock, limestone, sandstone, shales or coal. The upper layer is not yet hardened, and consists of clay, sand, shells of animals, and plants.



(2) This is the section after rivers have developed valleys and after weathering has cut down the whole land level. Compare the level *A* in this illustration with the level in preceding illustration. What has become of the material mentioned?



(3) This is the section showing the effects of glaciation; (1) the old rivers are destroyed; (2) the region is built above the level *A*. Name the other changes. What does the part marked *M* show?



GLACIAL MAP OF INDIANA (AFTER FRANK LEVERETT)

Areas of glacial lake bottom.

+ + + + Areas north of this line, except moraines, are sand and gravel plaines

Moraines

ooooo Dune areas

The drift, the materials left by the glacier, is thus very deep, sometimes 400 to 500 feet thick, although the usual thickness is about 100 feet. The effect of this deep soil is to render the land more productive, because of the large number of elements of fertility it contains and because it will withstand drought better than a soil which is closely underlaid with rock.

Sometimes the clay, sand, rocks, and earth of all kinds were left piled up in great heaps where they fell at the sides and at the end of the glacier. These great deposits of earth, called moraines, are to be seen in many places in central and northern Indiana. In many places they changed the character of the surface, making hills and valleys, changed the courses of rivers, and made lakes and ponds.

Dune Park is near Gary, Ind. Lake Michigan is seen in the distance.

This is especially the case in the northern part of the state, where a great number of lakes were left. The largest of these are Turkey Lake and James Lake. The smallest lakes are mere ponds. Steuben County contains fifty-seven and Kosciuscko County forty lakes of various sizes. Great beds of sand and gravel were left by the glacier. These are very important in making mortar, plaster, and concrete, in pike road construction and in ballasting railroad beds.

The close of the Ice Age has been in comparatively recent times so far as geology is concerned. The process of new stream formation has been going on since that time. New valleys are being made and some of the swamps and lakes left by the glacier have been drained. But all this has not progressed further in land growth than a youth has progressed in his life as a man.

Review questions and suggestions

1. Explain how the rocks that underlie the surface of Indiana were formed. 2. Explain how the coal beds or coal measures were formed. 3. Tell how the dry land was formed. 4. What is meant by the Ice Age? 5. From what direction did the snow and ice that traveled over the surface of the state during this age come? 6. Where are glaciers now to be found like those that covered Indiana during the Ice Age? 7. Where did the southern border of this ice sheet cross Indiana? 8. What effect did the Ice Age have on the surface of the state? 9. Describe the soil left by the glaciers. 10. What is a moraine? 11. Are there moraines in your neighborhood? 12. Account for the large number of lakes in northern Indiana. 13. Examine the surface rocks in your neighborhood to see whether there are any marks of glacial action.

VII. GEOGRAPHIC REGIONS

Various geological and glacial influences furnish a basis for dividing the state into three sections:

(1) The Lake and Moraine region of Northern Indiana.

(2) Central Indiana.

(3) Southern Indiana.

Northern Indiana is, in general, that part

Northern Indiana

of the state north of the Wabash River. The portion around Lake Michigan was once a part of the bed of that lake. When the lake became smaller, it left great beds of sand exposed to the action of the wind. This has resulted in shifting sand hills, known as dunes. Along the western part of this region, there is some true prairie region. The region east of the prairie is lake and moraine region.

Moraines are deposits of soil, clay, sand, and gravel with many bowlders. This material was brought down by great glaciers many ages ago. In Indiana it is spread over the surface irregularly, and in some places to the depth of 400 or 500 feet. The soil of these moraines is called drift or till. The largest of these moraines begins near Monticello and runs to the northeastern corner of the state. The drift here is from 250 to 500 feet deep and its surface is rough and hilly. It is in this region that the greatest number of lakes are found. These lakes furnish good fishing and are the location of many summer resorts.

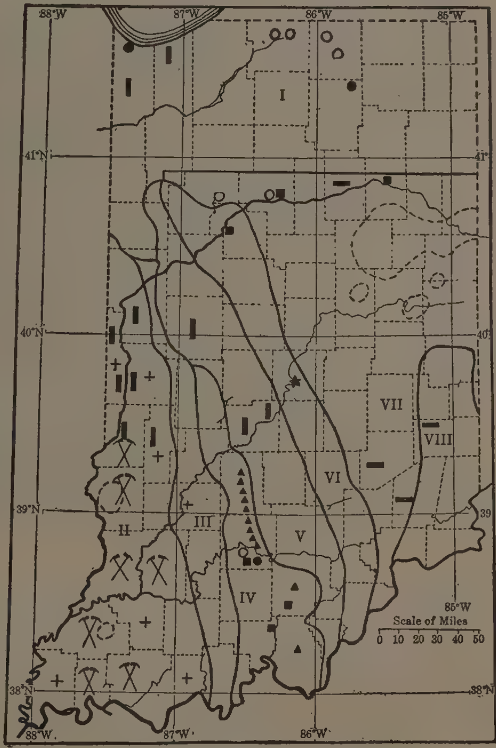
Central Indiana or the Central Drift Plain

The belt is bounded on the north by the Wabash River and on the south by an irregularly curved line beginning north of Terre Haute and extending across the state to the region of Brookville. The surface of this belt is quite level. The streams have cut shallow valleys into the plain in some places, but have rendered some of it so rough that it cannot be farmed. The drift varies in depth from 100 to 200 feet and the clay part of it is mixed with sand and gravel. This makes it more valuable as farm land.

The level character of this area, the fertility of the soil, and the good drainage make it the best agricultural section of the state.

Southern Indiana

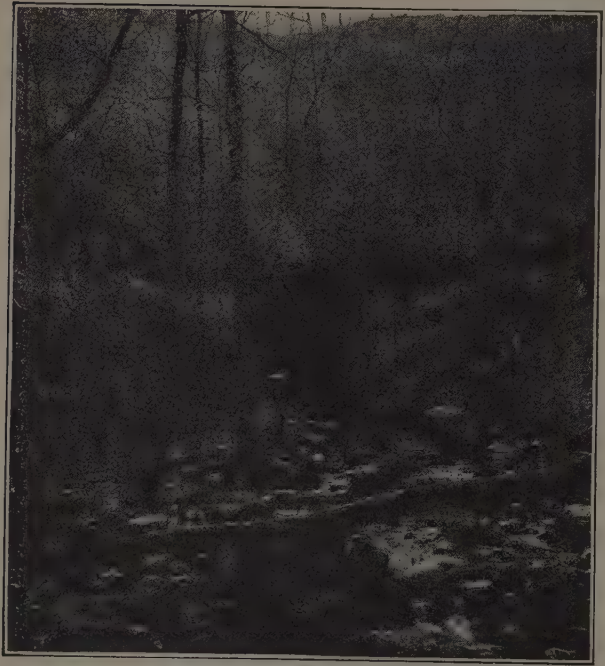
The southern Indiana belt extends from the southern border of the central belt to the Ohio. The northern edge of this belt was in some places covered by the glacial soil washed down by the rivers from the central belt. The rocks are very close to the surface in the upland portions, and they thus determine the character of the land surface. This is true even of the glaciated part because the drift is thin in most places. Valleys are deeper and have much steeper sides than those of other parts of the state. In the main the upland soils are much less fertile and much harder to maintain in this section than in other parts of the state. The valley soils are excellent.



GEOLOGICAL AND NATURAL RESOURCES OF INDIANA

▲ Oolitic limestone quarries
▬ Lime Kilns
▬ Niagara limestone quarries. Flag stone.
● Portland cement plants
○ Water Power plants
▮ Clay and shale industries
◌ Oil areas
⚒ Counties with more than 2,000,000,000 Tons of coal in them
+ Counties with from 1,000,000,000 to 2,000,000,000 Tons coal

I. Area of heavy moraines. lakes and sand areas.
II. Coal fields
III. Sandstone.
IV. Area of oolitic limestone.
V. Sandstone and knobstone shales.
VI. Shales.
VII. Niagara limestone.
VIII. Shales.



Donaldson's Cave near Mitchell.

Various belts of rocks run north and south across this area. Limestone, sandstone, and shale are all found. Much of the soil that has resulted from the decay of the limestone rock is very fertile, but the sandstone and shale soils are often unproductive. The two most striking belts are the knobstone belt and the "sink hole" belt. The knobs are found in Floyd, Clark, Scott, and Jackson counties. The sink-hole area lies just west of this. It is underlaid with numerous caves, of which Wyandotte and Marengo caves are the largest. As far north as Monroe and Owen counties, small caves are very numerous. The land surface is pitted with sink holes. They are usually shaped like a flat funnel, and at the bottom water seeps or flows into underground passages in the rocks. Some of these passages we know as caves; others have no openings to the surface. In a few cases, Lost River, for example, whole streams are lost. So great is the amount of water drained away by underground channels that the surface streams are very few in number as compared with other parts of the state.

Review questions and suggestions

1. In which of the great divisions of Indiana do you live? 2. Why is the state divided into these three sections? 3. Why does the moraine region contain so many lakes? 4. Why did Lake Michigan formerly extend farther south than at present? 5. Of what value are the Lake Michigan dunes? 6. Do they do any damage? 7. Tell what a prairie is. 8. What kind of soil do they usually have? 9. Are the lakes of northern Indiana increasing or decreasing in size? 10. Name some of the things producing this change. 11. Of what use are lakes? 12. Have you ever noticed deep scratches on the bowlders found in land passed over by

Lost River where it reappears near Orleans.

Note: The soils of the state are being studied and mapped by the Department of Geology of Indiana University, by the State Department of Geology, and by the United States Geological Survey. The soils are classified and the value and needs of each soil suggested.

the great glaciers? 13. Can you tell what has caused these scratches? 14. How do you know that these bowlders were not once a part of the bed of rock of Indiana? 15. Which section of the state is most nearly level? 16. Explain why it is so nearly level. 17. How deep do wells have to be dug in this section before bedrock is found? 18. How deep, then, is the drift in this area? 19. Are there any gravel pits near you? 20. For what is the sand and gravel used? 21. What crops are important in the central section? 22. Why is the southern section not so good for farming as the other sections? 23. What kind of soil is found in your locality?

VIII. SOILS

The soils may be grouped from their origin into two large classes; viz. the transported soils and the local soils.

Transported and local soils

In the northern and central divisions of the state the soils belong to the transported class because they were brought there and deposited by glaciers and by rivers and streams that flowed from the southern edge of the melting ice of the glacier. In the southern division, the soil of the river valleys is transported. Another form of transported soil in southeastern and southwestern Indiana is the loess. It is a wind-blown soil of very fine grain. The loess has buried part of the local soils in these sections. In other areas than the two just given, the soils of the southern section are local. In the southern division most of the soil is local soil produced by the decay of the surface rocks. Over some places in this section water and wind have transported soil, but in most of the region the soil is local in character.

Soils of the northern and central regions

The transported soils of the northern and central divisions of the state are a mixture of sand, gravel, clay. From the combination of these elements a great variety of fertile soils has resulted of which four kinds may be noted. There are clay soils, clay loam, which is a mixture of clay and sand with more clay than sand; sandy loam in which there is more sand than clay; and sandy soils. All these soils are extremely fertile.

In the central region the surface is level and the soil well drained. Much of it is loam, a soil with clay subsoil.

Soil of the southern region

The fertility of the soils of southern Indiana depends on the rocks from which each soil originates. The soils of this section are not of as high an average fertility as in the other sections of the state and because of the greater roughness of the land are harder to maintain. The limestone soils are of an excellent quality and the transported soils, both alluvial and loess, are fine agricultural soils.

Review questions and suggestions

1. Name all the ways you can by which soils may be transported. 2. Under what conditions are rivers best able to carry sediment? 3. Under what conditions do rivers deposit soil most readily? 4. Are floods beneficial in any way? 5. Under what conditions are fields most liable to "washing"? 6. What is the depth of the soil and sub-soil in the northern and central sections as compared with the depth in the southern sections? 7. What makes this difference in depth? 8. What effect does this difference have on the quality of the soil? 9. In which section is drought most liable to cause damage to crops? 10. What kind of soil do you have in your locality? 11. By what means are rocks caused to decay to produce soils?

IX. INDUSTRIES

Natural advantages

Indiana offers many industrial advantages. The surface is gently rolling and well drained. The soil is varied in character and extremely fertile. The climate is mild with long growing seasons and plenty of rain and sunshine. Raw material for industries is easily obtained. Markets are near and transportation facilities are excellent.

Agriculture

The natural advantages of climate and soil, with nearness to markets and transportation facilities, make Indiana one of the leading agricultural states. The leading activities are grain farming, fruit and vegetable farming, and live stock raising.

Rank in Agriculture

Rank in grain production

Grain farming was the first agricultural activity to be developed. That the growth along this line has been remarkable is shown by the fact that Indiana ranks among the ten greatest agricultural states, although it is the thirty-seventh state in size. So, from that standpoint, Indiana ranks first in grain production. Farm land has a high average value, ranking third among the states; and a large percentage of the land is improved. The level land, the quality of the soil, and the climate, especially the rainfall and the temperature, are the main factors in this high rank. But even this high rank is resulting in a loss in the resources of the state, because some areas are farmed so heavily in grains that the productive power of the soil is decreasing.

Grain and forage crops

1. Corn

Corn is the most important crop. The great corn-producing area is in the central drift plain. All the alluvial valleys produce immense crops. There is no part of the state in which corn cannot be grown, but the southern section is lowest in production. From 1900 to 1909, no state among the ten leading corn-producing states had so high an average yield per acre as Indiana. This yield was 34.7 bushels per acre.

2. Oats

The oats crop is largest in the corn belt of the Central Plain. Oats rank fourth in value among the cereals of the state.

3. Wheat

Wheat is second in value among the cereals and also among all crops. The soils of the southwestern part of the state favor wheat. Three counties, Knox, Gibson, and Posey, produced in 1909 more than a million bushels each, or more than one-tenth of the crop of the state. Another important area for wheat begins in Jackson County and extends north to the state line in a belt 50 or 60 miles wide. In this belt, 25 counties averaged a production of more than a half million bushels each and produced two-fifths of the crop of the state. Practically all wheat is marketed, thus making it unlike corn and oats in this respect.

4. Forage crops

The third crop in value is hay, or forage crop, timothy and clover. This crop is fairly well distributed over the state.

Fruits and vegetables

1. Fruits

The soils and climate of Indiana are well adapted to the raising of fruits and vegetables. Both orchard and small fruits can be grown especially well in the southern part of the state on soils that are not suited for grains. The limestone soils are suited for orchard fruits and the knobstone soils produce fine berry crops. The general excellence of Indiana fruit makes it desirable that more attention be given to fruit raising. Apples, peaches, and cherries make up the greater part of the orchard fruit crop.

2. Vegetables

Tomatoes and peas are raised in large quantities. The black muck soils around the lakes of northern Indiana are fine for the culture of onions, cabbage, and celery. Potatoes are raised in sufficient quantities for some to be shipped to other states.

3. Canning and preserving

The state is dotted all over with canning and preserving plants. The areas closely surrounding them furnish the supply of vegetables and fruits for these canneries.

Live stock

1. Horses

Because of the extensive cereal and forage farming, horses are found in large numbers and are of greater value than any other kind of live stock. The distribution of horses is determined by the amount of farming. Where will the greater number of horses be found? Mules are also used extensively in farming.

Cattle rank next to horses in value. Because of the fact that the acreage of pastures

2. Cattle

is not large, beef cattle are not produced in large numbers. Dairy cows are valued at about sixty per cent of all cattle. Dairying, while carried on all over the state, is most extensive in the northern counties. The great Chicago market is the cause of this distribution. A second important belt of dairying is around the Indianapolis market.

3. Hogs

Hogs are third in value. There are two reasons why hogs are raised so extensively: the greatness of the corn crop and the fact that the state is so close to the great packing centers of Indianapolis, Chicago, St. Louis, Kansas City, and Buffalo. The unusual railway facilities of the state and especially of Indianapolis are favorable to quick shipment of hogs.

4. Sheep

Sheep are raised in largest numbers in the northeastern part of the state, especially in Lagrange, Steuben, and Noble counties.

5. Poultry

Poultry is of even greater value than the sheep of the state. Chickens and turkeys are by far the most valuable forms of poultry.

Review questions and suggestions

1. Does Indiana produce a large or small number of agricultural products — grains, fruits, vegetables, and live stock — successfully? 2. Give several reasons why your answer is true. 3. Grain farming is making the soils of the state poorer. Name some ways in which the fertility of the soils can be maintained. 4. Name the six great corn-producing states. 5. Rank Indiana as a corn producer. 6. What counties produce the most corn? 7. Locate them as groups of counties. 8. Write a list of products made from corn. 9. Ask the Corn Products Company, Chicago, Illinois, for a booklet giving these products. An interesting and valuable exhibit can be obtained by larger schools from them at a low cost. 10. Explain how corn is grown and harvested. 11. What counties produce wheat in largest quantities? 12. Locate them as a group. 13. Why is this location favorable for wheat? 14. Enumerate the uses of wheat. 15. What are the possible causes of a failure in the wheat crop? 16. To what use is the oats crop put? 17. Name four or five forage crops grown in the state. 18. What are their uses? 19. Why are clover, alfalfa, and cowpeas especially valuable as forage crops? 20. Enumerate the fruits and berries that Indiana produces well. 21. Which ones are important in your locality? 22. Is there any relation between good apples and birds? What is it? 23. Have you any canneries in your county? 24. What do they can? 25. Make a list of the vegetables produced. 26. What is the relation of the large forage crop and dairying?

A dairy farm near South Bend.

Manufacturing

Favorable conditions

Because of the rank which Indiana holds as an agricultural state, it is hard to believe that the manufactured products are worth about one-half more than the live stock and the crops of the state combined. Indiana ranks ninth as a manufacturing state. The growth of manufacturing has been rapid for the following reasons:

1. The location of the center of population of the United States within its boundaries for 30 years;
2. The immense forest resources in early times;
3. The large fuel supply, coal, natural gas, oil, and the other natural resources already mentioned;

Courtesy Studebaker Corporation.

The Studebaker Corporation plant, South Bend.

4. The ease of transportation both by water and by rail;

5. The great amount of agricultural products upon which a large part of the manufacturing depends.

Leading industries

1. Slaughtering and meat packing

Slaughtering and meat packing is the state's greatest manufacturing industry; the total product is nearly $50,000,000; this does not include the animals slaughtered by retail butchers. Why should this industry be so important in Indiana? Are cattle or hogs slaughtered in greater numbers?

2. Flour milling

Flour mills and grist-mill products come next in value. Explain why this industry should be so important.

3. Machine-shop products

The products of foundry and machine shops, and of iron, steel, and rolling mills are each nearly as important as the flour mills. Thirty-five years ago, little of either line was manufactured.

The industries of making automobiles and automobile parts have grown rapidly in the last fifteen years. These industries now rank sixth in the state. No special reason, other than the central location of the state, can be assigned for the development of this branch of manufacturing.

4. Timber products

The largest number of manufactories in any single line (1277) was engaged in 1909 in manufacturing lumber and timber products. Closely connected with the lumber and timber products are carriages, wagons, and furniture, which follow in order.

5. Related industries

Car building and repairing, printing and publishing, the manufacture of farm machinery, glass, bread and bakery goods, and canning are important, all having annual products of $10,000,000 or higher. Thirty-nine other kinds of manufactories have annual outputs of more than half a million each. The peculiarity, then, of the manufacturing of Indiana is the fact that there is so large a number of products. Can you account for this condition? Prepare a list containing some of these products manufactured in Indiana.

Review questions and suggestions

1. What things needed in the manufacturing industries of the state are decreasing in amount in the state? 2. From what sources can these materials be obtained? 3. Are the most important manufacturing industries dependent on agricultural or mineral resources? Prove your statement. 4. Why should slaughtering and meat packing be so important in Indiana? 5. Are cattle or hogs slaughtered in greater numbers? Why do you think so? 6. What are the largest packing centers in the state? 7. What are the great flour milling centers of the state? 8. State why Indiana is such an important center for manufacturing when it is such a fine agricultural region. 9. Taking each of the important industries in turn, state where the raw material for each is obtained and how it is shipped. Where are the products sold?

Mineral Industries

Mineral resources The important mineral resources are coal, petroleum, natural gas, building stone, clay, shale, limestone, and marl.

1. Coal Soft coal is mined in Vigo, Sullivan, Greene, Vermilion, Knox, Clay, and, in smaller amounts, in thirteen other counties of the west central and southwestern parts of the state, or over one-fifth of its area. In 1914, 17,055,000 tons of coal, valued at $22,000,000, were mined. This supply of coal is very important in the development of the great manufacturing activities of the state.

Courtesy Mr. Edward Barrett.

Shooting an oil well.

2. Oil and natural gas Natural gas was formerly found in almost immeasurable quantities in the east central part of the state. Wasteful methods have almost used up the supply. This fuel has had much to do with the remarkable development of the manufacturing in the cites of the gas belt. Petroleum is found on the edges of the gas area. The production has been large and the oil is of a good quality. The supply is now on the decrease. Both gas and oil are found in or near the coal field in considerable quantities.

3. Building stone The building stone of Indiana is chiefly Bedford limestone. Some sandstone is quarried. The two centers for the production of limestone are Monroe and Lawrence counties. This stone is shipped all over the world and is especially in demand in erecting large buildings in cities. In 1910, Indiana ranked second in the production of limestone. In 1912, the value of this product was more than $5,000,000. The Soldiers' and Sailors' Monument at Indianapolis is built of Bedford limestone. It is so easily worked and so durable that it is valuable for statuary and carvings in such work as this.

4. Clay In its clay products Indiana ranks sixth in the United States. Usable clay beds are found all over Indiana, but the best

Oölitic limestone quarry.

known are at Brooklyn, Martinsville, Crawfordsville, Brazil, Cayuga, Verdersburg, and Terre Haute. Brick of all kinds, drain-tile and vitrified tile are among the most important of these products. Kaolin, a white clay, sufficiently pure to make fine pottery, is found in Lawrence and Martin counties.

5. Sand and gravel

Sand and gravel are both found in pits in the glacial drift. When secured from these sources, the sand and gravel are chiefly used for building purposes, concrete work, and road making. Some beds of sand are pure enough to be used for glass manufacturing. Some of the dune sand near Lake Michigan and sand made by crushing certain sandstones found in other parts of the state are much used in manufacturing glass.

Soldiers' and Sailors' Monument, Indianapolis.

6. Cement

The great shale, limestone, and marl beds of the state make Indiana the second largest Portland cement producer in the United States. Shales and pure clays may be had nearly everywhere. Limestone is plentiful along the Wabash River from Huntington to Delphi and in the oölitic stone belt of south central Indiana. Marl beds are common in and around the lakes. From these materials the cement is made.

7. Mineral water

Mineral waters of a high quality are widely distributed over the state. Wells or springs yielding mineral waters are located at French Lick and West Baden; at Silverwood, in Clark County; at Worthington, Spencer, Corydon, Winamac, and Michigan City.

Virgin forest, southern Indiana, Indiana University Farm.

Review questions and suggestions

1. What minerals do you have in your locality? 2. What are the principal mineral industries of the state? 3. In what section is coal mined? 4. In what counties is coal mined? 5. How does the local supply of coal help toward making manufacturing successful? 6. In what counties is petroleum found? Gas? 7. How valuable are these products at present? 8. Where in the state are the most valuable building stones quarried? 9. Is building stone quarried near your home? 10. Under what geological circumstances were these quarries formed? 11. How is clay used in manufacturing? 12. For what is drain-tile used? 13. How is sand used in building? Gravel? Cement? 14. Locate the principal mineral springs in the state.

Forest Industries

The forests

Seven-eighths of Indiana was formerly covered by hardwood forests. Unscientific cutting and the removal of timber in clearing land for farming has taken most of the valuable timber. In 1909, Indiana had fallen from the thirteenth rank as a timber producer to the twenty-sixth rank. There is now great need for reforesting many areas. This would result in preventing the washing of lands and would also lessen floods in basins thus reforested.

The hard woods of Indiana were of the highest quality. They soon attracted manufacturers of furniture, farming implements, and finishing woods. Much of the supply for these purposes is now shipped in from other states.

Courtesy of State Forestry Board.

An experimental plot, State Forest Reservation.

About 1900, the state purchased a tract of 2000 acres in Clark County. The State Board of Forestry was created to take care of this tract and is conducting an important experiment in reforestation and the care of forests.

Courtesy of Dr. J. N. Hurty.

Child conservation. Mothers and babies in House of Representatives during "Healthy Baby Contest."

Review questions and suggestions

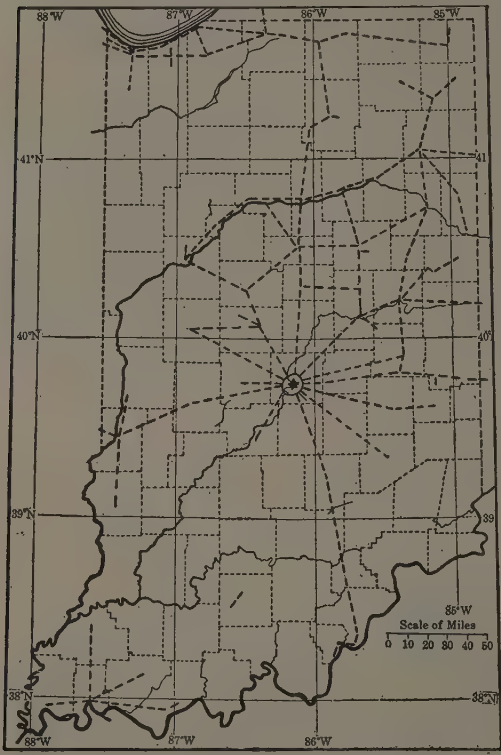
1. Do woodlands wash more or less than cultivated lands? Why? 2. What assistance do large forests render in the prevention of floods? Why? 3. What has become of the greater part of the forests of Indiana? 4. What are the principal kinds of trees in the forests? 5. Would it be possible to plant forest trees on rough land and make the venture profitable? 6. What trees can be grown to advantage under these circumstances?

NOTE: The idea behind this conservation of forests is slowly getting into all lines. Hospitals for defective, insane, and diseased, and special state organizations for conservation of child life have been established. There are fish hatcheries supported by the state. Wild bird life is protected by law.

X. TRANSPORTATION AND COMMERCE

General plan of the roads

Before many permanent settlements were made in Indiana, Thomas Jefferson had suggested a plan for surveying the Northwest Territory. By this plan, as it was finally carried out, the territory was divided into Congressional Townships. These were six miles square. The common roads were expected to run on the section lines wherever the surface features of the land would permit. This made the plan of the roads east-west and north-south in direction. The working of the plan is best seen in the central and northern parts of the state, although parts of the southern portion also show the plan.



THE HIGHLY DEVELOPED ELECTRIC INTERURBAN SYSTEM OF INDIANA

Good roads

Indiana possesses an abundance of road-building material and many of its roads are good, but not so good as the materials would warrant. At the present, there are about 22,000 miles of gravel roads in the state. Name some of the values of good roads. Do they have any relation to the free rural delivery system? To the consolidated schools? Practically all raw material as it leaves its source for the great channels of commerce and manufacturing first travels over the common roads. So that the cost of most articles is partially determined by the quality of roads over which the raw material which goes into their manufacture passes.

Two roads, the Michigan road and the National road, are widely known in the state. The former is a north-south road. The latter road enters the state near Richmond and extends through Indianapolis and crosses into Illinois near Terre Haute.

The "Good Roads" movement has resulted in the projection of two other highways, the Lincoln and the Dixie highways. The Indiana sections of these roads are but parts of great systems extending into other states. The Lincoln highway extends east and west across the northern part of the state. This road is partially completed. The Dixie highway, when completed, will extend from Chicago to Florida.

Canals

The only canal of any importance in the state was the old Wabash-Erie Canal from Toledo to Evansville. This canal followed the Maumee and Wabash valley to Terre Haute. Here it left the Wabash valley and crossed country to Evansville. The traffic on the canal was very heavy up to the time that railroads began to be built. It was somewhat used up to about 1875. There is a canal projected from Toledo across Ohio and northern Indiana to Lake Michigan. What would be the commercial value of such a canal?

The location of Indiana is such that nearly all the great transcontinental railroads cross

Railroads

it. These roads are chiefly east-west lines, but there are enough north-south lines to care for the traffic. There are now more than 7600 miles of railroad in the state. The principal railroad systems that cross or have branches in the state are: The Lake Shore and Michigan Southern, the Pennsylvania, the Grand Trunk, the Southern, the Baltimore and Ohio, the Wabash, the Monon, the Erie, the Clover Leaf, the Illinois Central, New York Central and St. Louis, Big Four, Michigan Central, Lake Erie and Western, South Western, the Grand Rapids and Indiana, and the Chesapeake and Ohio. The Big Four, the Monon, the Pennsylvania, and the Grand Rapids and Indiana are the important north-south lines.

Electric lines

The most recent development in transportation is the electric line. Indianapolis, the gas-belt cities, and the northern cities are the centers for interurban traffic. Thus far, they have not carried any large amount of freight, but do have heavy passenger service.

Review questions and suggestions

1. Do the roads of your locality run in east-west and north-south directions? 2. Why do they not always run so? 3. Of what materials are your pike roads built? 4. Where is the material obtained? 5. Where was water obtained for the Wabash-Erie canal? 6. How were the boats moved? 7. From how far were products of the farm hauled to the canal for shipment? 8. Do you know any of the "canal towns," that were important shipping centers? 9. What route must boats now take in carrying goods from southern Lake Michigan to Cleveland or Buffalo? 10. What saving would be made by having a canal from Lake Michigan to Toledo? 11. Name the great trunk lines of railroads crossing Indiana. (See the large state map.) 12. Why are there more east-west railroads than north-south ones? 13. Of what service are the large number of traction lines?

XI. POPULATION

The increase in population

The estimated population of Indiana on Jan. 1, 1914, was 2,779,467. The growth of the state has been constant since the first census in 1800, when there were only 5600 people in the territory. Up to 1880 the percentage of increase in Indiana was larger than it was in the United States. Since 1880 it has been lower than that of the whole country. From 1890 to 1900 the growth was faster than for the preceding ten years. Can you tell why? The center of population of the United States has been in Indiana for more than thirty years.

Changes in population

The movement of population in the state has been toward the cities for a number of decades. The growth of the five largest cities averaged forty-one per cent between 1899 and 1909, while the state showed an increase of only seven per cent. This growth of the five cities is below their average increase since 1860. Seventy-four counties out of the ninety-two show a decrease in rural population for the last decade, and fifty-six counties show a decrease in total population. What has caused population to move to the cities? Can you name any farm and city problems that have resulted from this rapid increase?

Races

A large percentage (seventy-nine per cent) of the people of Indiana are native-born whites of native parentage. Germans, Hungarians, Austrians, Irish, English, Russians, and Italians are, in the order of their naming, the most numerous inhabitants of foreign birth.

XII. CITIES

Indianapolis

1. Location

INDIANAPOLIS, the capital of Indiana, is located on White River near the center of the state. This location was chosen by a commission appointed by the Governor in 1820 and the capital was moved here in 1824. At that time there were but 500 inhabitants. The thing that recommended the site to the commission was its

State House, Indianapolis.

central location. The region about is a fine agricultural area, but this was not developed at that time. This has had much to do with the city's subsequent growth however. Explain how this fact has helped. Its location near great fuel supplies has helped greatly in the development of this city. What fuel supplies are near it? A study of the map of the north central states will show that Indianapolis is located nearly at the crossing of lines from Cincinnati to Chicago, from Louisville to Chicago, and from Cleveland and Pittsburgh to St. Louis. So close is it to this point that it has drawn a great number of railroads to it, and it is now the greatest inland railroad center in the United States.

2. Industries

Its most important industry, packing, is based upon the fact that a large supply of live stock, particularly hogs, is readily obtained. It packs eighty per cent of the total of the state. The other important industries are: Machine shops and foundries; flour mills and grist mills; automobiles and auto parts; printing and publishing; canning and preserving; and the lumber industry. Metal working and certain food products rank high. Wholesale trade in many lines is carried on.

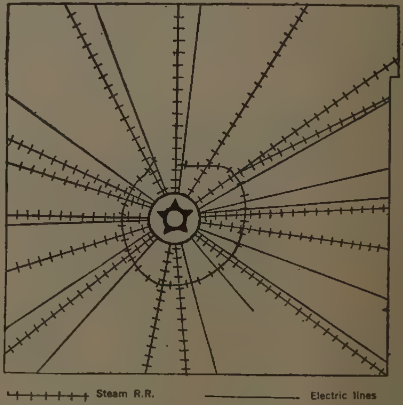
3. Facts of interest

An army post, Fort Benjamin Harrison, is located just outside of the city. The city is also widely known because of its unusual interurban facilities.

It is the seat of the medical school of Indiana University and the Long Hospital, which belongs to the University, and of Butler College. The latter school is one of the church schools of the state. It was founded and is maintained by the Disciples of Christ.

Evansville

EVANSVILLE, the county seat of Vanderburg County, is the second city of the state in population. It has seven steam roads besides interurban connections. An equal number of steam-



Diagrammatic map of Marion County and Indianapolis to show the importance of the latter as a railroad center.

Federal Building, Indianapolis. Used for the Post Office and for the Federal Courts and their officers.

boat lines put it in touch with points on the Ohio, Green, Cumberland, Tennessee, and Mississippi rivers. This river relation puts it in easy touch with the hardwood forests of the South and thus makes Evansville an important lumber and furniture center. It lies in the coal fields. What effect does this have on manufacturing? What is the greatest wheat-producing region in the state? What industry could you predict for Evansville? Other important products are buggies and steam shovels. The city is also an important wholesale center.

Fort Wayne

Fort Wayne, the county seat of Allen County, is situated in one of the richest agricultural parts of the state. To the east lies the level lake plain of old Lake Maumee, which once extended to what is now the corporation limits of the city. To the southwest is the old Wabash-Maumee valley, in which the soil is very fertile.

The geographic causes for the location of Fort Wayne are very interesting. The St. Joseph River from the north and the St. Mary's from the south unite here to form the Maumee, which flows into Lake Erie. The old valley to the southwest made this point a natural meeting point of the Indians and the fur traders. Fort Miami was built here to control the Indians. This name was changed later to Fort Wayne in honor of General Anthony Wayne. The valley east and west brought the Wabash and Erie Canal and later the railroads have favored the growth of the city.

It has third rank in population and in manufactured products. Its foundries, car shops, factories

A view of Evansville.

Photo by Mr. Adolph Melzer.

Southern Indiana Hospital for the Insane, Evansville.

making electrical machinery, and knitting mills are the other important manufactories.

The State School for the Feeble Minded Youth is located here.

Terre Haute

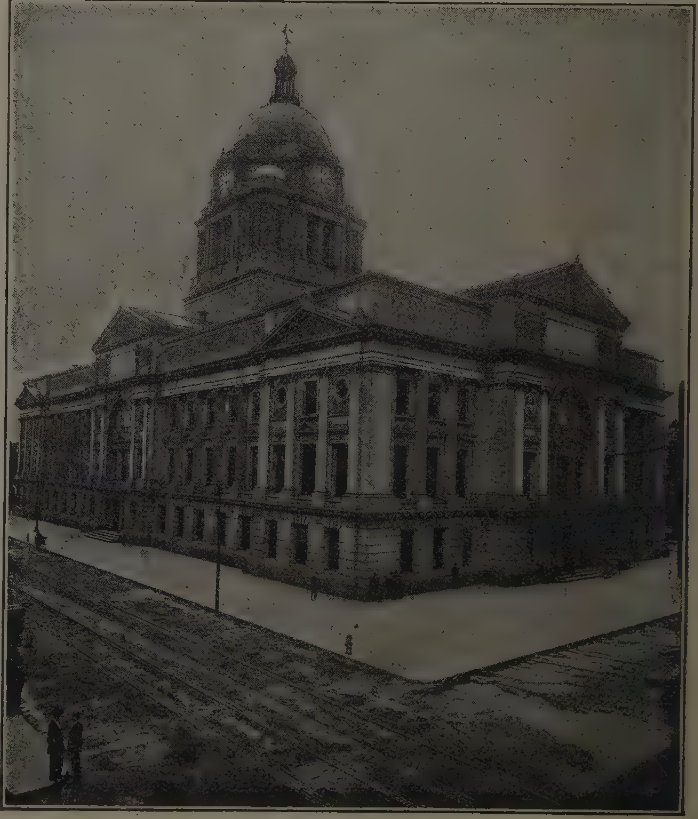
Terre Haute, a French name meaning high ground, is the county seat of Vigo County. It is located on a terrace in the Wabash valley. Car shops and flour and grist mills are among its leading industries.

In addition to the State Normal, Rose Polytechnic Institute, a technical school, is located at Terre Haute.

South Bend

South Bend is located in St. Joseph County at the most southern bend of the St. Joseph River, hence the name. The surrounding section is a fine agricultural region and the St. Joseph River and the Elkhart River both furnish water power. In population the city ranks fifth in the state, and in the products of its factories it ranks second. The plow works and the wagon works located here are the largest in the world. In recent years the automobile industry has developed greatly. Other products are carriages, sewing machine cases, and men's shirts. Transportation both by steam and electric roads is good.

Notre Dame University is located at Notre Dame near South Bend.



Court House, Fort Wayne.

St. Mary's College and Academy, a school for young women, is near the city.

Courtesy Prof. U. O. Cox.

The library, State Normal School, Terre Haute.

The Lake Michigan cities

Hammond, East Chicago, Michigan City, Gary, Whiting, Laporte, Mishawaka, Elkhart, Goshen, and Valparaiso make an important group of cities near Lake Michigan.

Hammond, East Chicago, Gary, and Whiting are comparatively new cities. They are all growing rapidly and their life is largely industrial. Hammond has large distilleries which, together with car shops, foundry and machine shops, and canneries, constitute its chief industries. East Chicago has large steel works and rolling mills. Gary has one of the largest steel plants in the United States. The ore is brought in by steamers from the Michigan and Minnesota iron mines. Where would fuel be obtained? It is the youngest city in the state. What was its population in 1900? Gary and the next city, Michigan City, are the largest of Indiana's lake ports. Whiting has great oil-refining plants. Michigan City is widely known for its manufacture of steam-railway cars. The State Prison is located here. Laporte makes traction engines, threshing machines, and gasoline tractors. Mishawaka's largest factory is for the manufacture of rubber boots and shoes. Elkhart has extensive car repair shops. Valparaiso is the seat of one of the largest private Normal Schools in the country. Goshen produces furniture and other wood products. Flour mills and foundries are also located here.

Courtesy Prof. U. O. Cox.

Vocational Building, Indiana State Normal School.

The Wabash River cities

Huntington is a center for the burning of lime. Two or three lines of cabinet work are followed and car repair shops are large. Wabash manufactures strawboard and furniture. Peru makes furniture and refrigerators. Logansport has car repair shops. Lafayette is a packing center. It also manufactures electric meters, steering gears, safes, and

Courtesy of M. Rumely Co.

An Indiana threshing scene.

strawboard to the value of nearly a half million dollars each per year. Clinton is a mining center. Vincennes, the oldest city in the state, is the seat of Vincennes University. The coal field surrounds it and the farming interests are large. What is the chief farm product? Steel and glass are other products.

The gas belt group and cities of the central plain

1. Cities in the gas belt

Hartford City, Muncie, Anderson, Marion, Elwood, and Kokomo are the important cities of the gas belt. None of these were prominent until after the discovery of gas in 1886. These cities then grew by leaps and bounds. Their manufacturing plants showed the greatest growth and the population increased in response to the demand for labor. Explain why manufacturing grew so rapidly. Rolling mills, steel mills, wire mills, glass, machinery, tools, automobiles, and tin plate are the important products. Why would steel mills, rolling mills, and glass factories be attracted to these cities? Since the failure of natural gas have these cities declined? Give a probable reason for your answer.

Muncie produces glass cans and other forms of glass, automobiles, wire and wire fencing, and steel. Anderson has rolling mills and steel mills. Marion produces glass, paper, strawboard, machinery, and drop forgings. Elwood has large steel works and rolling mills. Hartford City makes paper and glass. A citizen of Kokomo is authoritatively claimed to have produced the first automobile and the city is now heavily engaged in producing them. The potteries, plate glass and art glass factories, wire mills, nail mills, and rubber tire mills are the other important manufactories.

The new Harmar school building in Fort Wayne. Representative of the most advanced type of ward school buildings.

2. Richmond

RICHMOND, while not in the gas belt, had the advantages of gas while it was plentiful. It is manufacturing farm machines, traction engines, threshers, tools, furniture, caskets, and pianos. Earlham College is located here.

High School, Muncie. A fine example of the new High School Buildings of Indiana.

3. Cities in the Central Plain

CRAWFORDSVILLE, LEBANON, GREENCASTLE, NEWCASTLE, and NOBLESVILLE belong to the Central Plain. The first of these cities manufactures wire, nails, matches, brick, and boxes. It is widely known as the home of General Lew Wallace. Wabash College is located here. Canneries and milk condenseries are located at Lebanon. Cabinets are produced here also. Greencastle is best known as the seat of DePauw University, a school for both young men and women. Newcastle is famous for its roses. It manufactures pianos. Noblesville manufactures strawboard, enameled ware, and flour.

Ohio River cities

Evansville has been mentioned under the five largest cities of the state. NEW ALBANY and JEFFERSONVILLE have considerable river shipping. New Albany has tanneries, steel mills, and rolling mills. Jeffersonville has large car works. The State Reformatory is located at this place. Madison, further east on the river, is the seat of Hanover College. Compare the number of large cities in the unglaciated part of the state with those of the glaciated part. Can you account for this?

Other cities

BRAZIL is in the heart of the coal field. Fine brick, both for building construction and paving, are manufactured here. MARTINSVILLE has extensive shale beds used in the manufacture of brick. Its sanitariums are widely known. SYRACUSE manufactures large quantities of Portland cement from the marl deposits in the lakes near the town. BLOOMINGTON is one of the two centers of the Bedford stone industry. Quarries and mills are found all along the Monon Railroad, in Monroe and Lawrence counties. One of the largest furniture factories in the country is located at BLOOMINGTON. Another timber industry in which Bloomington is one of the best centers in Indiana is the production of railroad ties. The state university is located here. BEDFORD is the other important center for limestone. FRENCH LICK and WEST BADEN rank high in

Courtesy Supt. J. T. Giles.

Art Gallery, High School, Richmond, Indiana.

their production of natural mineral waters and they are known both in the United States and Europe as health resorts. MITCHELL and BUFFINGTON are heavily engaged in making Portland cement. FRANKLIN is the seat of Franklin College. AUBURN manufactures automobiles. KENDALVILLE produces refrigerators.

Review questions and suggestions

1. Draw an outline map of the state. 2. Draw the rivers. 3. Indicate upon this map the location of the five largest cities. 4. Indicate also the location of your home town or city, and the neighboring towns and villages. 5. Draw on the map the principal railroad lines that pass through your home city. 6. Extend these lines to show how they connect with the other cities of the state. 7. Make a list of the principal manufactured articles made in your home city; in neighboring cities. 8. How are these articles shipped to other cities? 9. Where are they finally consumed? 10. What raw material for manufacturing is shipped into your home city? 11. From where does it come? How? 12. Tell briefly the history of the founding of Indianapolis. 13. Give facts of interest connected with the other leading cities of the state.

Library and Student Building, Indiana University.

XIII. EDUCATION

The permanent school fund

The National Congress gave to the state one section of land, the sixteenth section, out of each congressional township, for school purposes. This made the state owner of more than 650,000 acres. Most of this land was sold when the state was new, so that its sale brought in only $2,500,000. This money is known as the permanent school fund. It has been added to from other sources until it is now about $11,000,000. The interest from the Congressional Township fund is distributed to the townships to which it belongs, and the interest on the remainder of the fund goes to the counties and is redistributed to the townships.

Kinds of schools

The schools of the state are the common schools, consisting of district and graded schools and of high schools. In 1914, there were about 450 commissioned high schools besides nearly 350 of lower rank. The district schools are decreasing in number. This is particularly true in the central part of the state, where consolidated graded schools are displacing the district school. High schools are conducted in the same building in many cases. No state in the United States has made greater strides in this field of consolidated schools than has Indiana. Such schools are less expensive and more efficient.

Vocational work

Indiana schools rank high in vocational work. The various branches of work included under vocational work give to the student work of a practical character. Many of the consolidated schools as well as the town and city high schools offer vocational courses that meet the needs of students in each kind of community.

Higher education

Public higher education is cared for by the State University at Bloomington, by Purdue University at Lafayette, and by the State Normal at Terre Haute. Indiana University with its medical school at Indianapolis now has an annual attendance of about 3000. This institution has been the birthplace of college presidents and teachers. For all literary, professional, and scientific pursuits, its courses furnish excellent preparation.

Purdue University is the state technical school. Its courses include, in addition to a regular college course, engineering courses of all kinds, courses in forestry, and courses in all phases of agriculture such as general farming, stock raising, and fruit culture. Purdue is the seat of the state experiment station, money for the maintenance of which is furnished by the United States government. A large farm adjoining the University is the site of the work in the above lines.

The State Normal at Terre Haute is the school for the training of teachers. This school also has a college course, but its important work is as stated above.

A string of prize winners (Purdue University).

XIV. THE GOVERNMENT

Departments of government

Just as in the government of the United States, there are three departments of the state government: (1) A branch which makes the laws; this is the legislative branch; (2) a branch which judges the laws; this is the judicial branch; (3) a branch which enforces the laws, the executive department.

1. The legislative department

This body is divided into two parts, the House of Representatives and the Senate. There are 100 representatives and 50 senators. The population of the state is divided into 100 districts based on population for the purpose of selecting representatives, and into 50 districts for senators. The former hold office for two years and the latter for four years. The Legislature, which these two groups of men constitute, meets for a period of 61 days every two years.

Does the legislature meet in the odd or the even years? Do you know what officer presides over the Senate? over the House? Find, if you can, what salary senators and representatives get.

2. The judicial department

This department is composed of the state Supreme Court, the Appellate Court, sixty-two Circuit Courts, and minor courts such as Mayor's Courts, Police Courts, and Justice of the Peace Courts. The judges in all of these courts are elected by the people whom they serve. The Clerk of the Supreme Court is a member of this department.

3. The executive department

The officers are the Governor and the Lieutenant Governor. They are elected by the voters of the state and hold office for four years each. The Lieutenant Governor becomes Governor upon the death or resignation of that officer. What is the chief duty of the Lieutenant Governor?

Under the Executive department there is another group of officers known as the administrative officers. These officers are: Secretary of State, Auditor, Treasurer, Attorney-General, Superintendent of Public Instruction, State Geologist, and State Statistician. These officers are really aids to the Governor in the enforcement of the laws.

Since the state has become so densely populated, certain boards have been created to aid further in law enforcement. In a limited way, these boards are also legislative. The Board of State Charities, the State Health Board, the State Board of Education, the Boards governing the state schools of higher learning, the Boards governing the reform schools, reformatory, and state penitentiary, Boards for the various state hospitals and asylums, Boards of examination, and Boards of agriculture and forestry are the most important. The greater number of the members of these Boards are appointed by the Governor.

Review questions and suggestions

1. Name the state school officers and boards. 2. Who compose the state Board of Education? 3. Name the chief county school officer. 4. How is he elected? 5. Who compose the county Board of Education? 6. Name the chief township school officer. 7. Name the chief city school official. 8. Who is now state superintendent? 9. Who is your county superintendent? 10. Who is your trustee? 11. Name the members of your city Board of Education. 12. What is a consolidated school? 13. Make a list of the state schools and of the colleges of the state, telling where each is located. 14. Taking the state officers in the order in which they are named, tell who occupies each office. 15. Who is your state representative? 16. Who is your state senator? 17. Name some of the subjects upon which the legislature makes laws. 18. Where does the legislature meet? 19. Does it meet in the odd

or the even years? 20. What officer presides over the Senate? 21. What officer presides over the House? 22. Find what salary representatives and senators get. 23. Where are some of the state reform schools, homes, and hospitals located? Make as nearly a complete list of them as you can. 24. Name men who have been prominent in the political and the literary life of the state. 25. In the names given in these two lists, for what is each known?

ACKNOWLEDGMENTS

Reference has been made in the preparation of this supplement to the following reports:

Reports of the Department of Geology and Natural Resources.

Reports of the State Statistician.

Reports of the Board of Forestry.

Reports of the United States Geological Survey, especially Monograph 53.

Reports of the Industrial Board.

Abstract from the Thirteenth Census of the United States, Indiana Supplement.

Summary of the Climatological Data for the United States, Sections 67 and 68.

Many School Superintendents and Principals have coöperated in furnishing industrial data and photographs. Other photographs have been furnished by Mr. Adolph Melzer, Evansville; Indiana University; State Normal School; Shaw and Cosner; The M. Rumely Co.; The Studebaker Corporation; Supt. J. T. Giles; Supt. B. F. Moore; The State Forestry Board; Dr. J. N. Hurty, Secretary State Board of Health; Mr. Edward Barrett, State Geologist.

Mr. J. H. Armington of the Indianapolis Weather Bureau and Mr. J. Z. A. McCaughan have both offered valuable suggestions.

APPENDIX A

STATISTICS FOR THE COUNTIES OF INDIANA AND THEIR COUNTY SEATS

COUNTY	LAND AREA	POPULATION 1900	POPULATION 1909	COUNTY SEAT	POPULATION OF COUNTY SEAT 1900	POPULATION OF COUNTY SEAT 1910	POPULATION OF COUNTY PER SQ. MI. 1910
Adams	337	22,232	21,840	Decatur	4,142	4,471	64.8
Allen	661	77,270	93,386	Ft. Wayne	45,115	63,933	141.3
Bartholomew	407	24,594	24,813	Columbus	8,130	8,813	61.0
Benton	408	13,123	12,688	Fowler	1,429	1,491	31.1
Blackford	168	17,213	15,820	Hartford City	5,912	6,187	94.2
Boone	427	26,321	24,673	Lebanon	4,465	5,474	57.8
Brown	324	9,727	7,975	Nashville	393	354	24.6
Carroll	377	19,953	17,970	Delphi	2,135	2,161	47.7
Cass	416	34,545	36,368	Logansport	16,204	19,050	87.4
Clark	375	31,835	30,260	Jeffersonville	10,774	10,412	80.7
Clay	361	34,285	32,535	Brazil	7,786	9,340	90.1
Clinton	408	28,202	26,674	Frankfort	7,100	8,634	65.4
Crawford	303	13,476	12,057	English	583	649	39.8
Daviess	433	29,914	27,747	Washington	8,551	7,854	64.1
Dearborn	313	22,194	21,396	Lawrenceburg	4,326	3,930	68.4
Decatur	378	19,518	18,793	Greensburg	5,034	5,420	49.7
Dekalb	370	25,711	25,054	Auburn	3,396	3,919	67.7
Delaware	392	49,624	51,414	Muncie	20,942	24,005	131.2
Dubois	427	20,357	19,843	Jasper	1,863	2,196	46.5
Elkhart	462	45,052	49,008	Goshen	7,810	8,514	106.1
Fayette	216	13,495	14,415	Connersville	6,836	7,738	66.7
Floyd	148	30,118	30,293	New Albany	20,628	20,629	204.7
Fountain	395	21,446	20,439	Covington	2,213	2,069	51.7
Franklin	394	16,388	15,335	Brookville	2,037	2,169	38.9
Fulton	367	17,453	16,879	Rochester	3,421	3,364	46.0
Gibson	486	30,099	30,137	Princeton	6,041	6,448	62.0
Grant	423	54,693	51,426	Marion	17,337	19,359	121.6
Greene	543	28,530	36,873	Bloomfield	1,588	2,069	67.9
Hamilton	399	29,914	27,026	Noblesville	4,792	5,073	67.7

STATISTICS FOR THE COUNTIES OF INDIANA AND THEIR COUNTY SEATS—*Continued*

COUNTY	LAND AREA	POPULATION 1900	POPULATION 1909	COUNTY SEAT	POPULATION OF COUNTY SEAT 1900	POPULATION OF COUNTY SEAT 1910	POPULATION OF COUNTY PER SQ. MI. 1910
Hancock	307	19,189	19,030	Greenfield	4,489	4,448	62.0
Harrison	486	21,702	20,232	Corydon	1,610	1,703	41.6
Hendricks	408	21,292	20,840	Danville	1,802	1,640	51.1
Henry	397	25,088	29,758	Newcastle	3,406	9,446	75.0
Howard	297	28,575	33,177	Kokomo	10,609	17,010	111.7
Huntington	386	28,901	28,982	Huntington	9,491	10,272	75.1
Jackson	518	26,633	24,727	Brownstown	1,685	1,492	47.7
Jasper	562	14,292	13,044	Rensselaer	2,255	2,393	23.2
Jay	375	26,818	24,961	Portland	4,798	5,130	66.6
Jefferson	364	22,913	20,483	Madison	7,835	6,934	56.3
Jennings	383	15,757	14,203	Vernon	557	453	37.1
Johnson	322	20,223	20,394	Franklin	4,005	4,502	63.3
Knox	510	32,746	39,183	Vincennes	10,249	14,895	76.8
Kosciusko	541	29,109	27,936	Warsaw	3,987	4,430	51.6
Lagrange	387	15,284	15,148	Lagrange	1,703	1,772	39.1
Lake	492	37,892	82,864	Crown Point	2,336	2,526	168.4
Laporte	595	38,386	45,797	Laporte	7,113	10,525	77.0
Lawrence	456	25,729	30,625	Bedford	6,115	8,716	67.2
Madison	450	70,470	65,224	Anderson	20,178	22,476	144.9
Marion	397	197,227	263,661	Indianapolis	169,164	233,650	664.1
Marshall	441	25,119	24,175	Plymouth	3,656	3,838	54.8
Martin	339	14,711	12,950	Shoals	683	1,015	38.2
Miami	381	28,344	29,350	Peru	8,463	10,910	77.0
Monroe	416	20,873	23,426	Bloomington	6,460	8,838	56.3
Montgomery	501	29,388	29,296	Crawfordsville	6,649	9,371	58.5
Morgan	406	20,457	21,182	Martinsville	4,038	4,529	52.2
Newton	405	10,448	10,504	Kentland	1,006	1,209	25.9
Noble	417	23,533	24,009	Albion	1,324	1,213	57.6
Ohio	85	4,724	4,329	Rising Sun	1,548	1,513	50.9
Orange	407	16,854	17,192	Paoli	1,186	1,278	42.2
Owen	393	15,149	14,053	Spencer	2,026	2,150	35.8
Parke	447	23,000	22,214	Rockville	2,045	1,943	49.7
Perry	384	18,778	18,078	Cannelton	2,188	2,130	47.1
Pike	338	20,486	19,684	Petersburg	1,751	2,170	58.2
Porter	415	19,175	20,540	Valparaiso	6,280	6,987	49.5
Posey	402	22,333	21,670	Mt. Vernon	5,132	5,563	53.9
Pulaski	432	14,033	13,312	Winamac	1,684	1,607	30.8
Putnam	483	21,478	20,520	Greencastle	3,661	3,790	42.5
Randolph	447	28,653	29,013	Winchester	3,705	4,266	64.9
Ripley	448	19,881	19,452	Versailles	501	486	43.4
Rush	409	20,148	19,349	Rushville	4,541	4,925	47.3
St. Joseph	460	58,881	84,312	South Bend	35,999	53,684	183.3
Scott	190	8,307	8,323	Scottsburg	1,274	1,669	43.8
Shelby	407	26,491	26,802	Shelbyville	7,169	9,500	65.9
Spencer	403	22,407	20,676	Rockport	2,882	2,736	51.3
Starke	305	10,431	10,567	Knox	1,466	1,644	34.6
Steuben	305	15,219	14,274	Angola	2,141	2,610	46.8
Sullivan	460	26,005	32,439	Sullivan	3,118	4,115	70.5
Switzerland	222	11,840	9,914	Vevay	1,588	1,256	44.7
Tippecanoe	503	38,659	40,063	Lafayette	18,116	20,081	79.6
Tipton	260	19,116	17,459	Tipton	3,764	4,075	67.2
Union	162	6,748	6,260	Liberty	1,449	1,338	38.6
Vanderburg	233	71,769	77,438	Evansville	59,007	69,647	332.4
Vermilion	254	15,252	18,865	Newport	610	732	74.3
Vigo	409	62,035	87,930	Terre Haute	36,673	58,157	215.0
Wabash	425	28,235	26,926	Wabash	8,618	8,687	63.4
Warren	368	11,371	10,899	Williamsport	1,245	1,243	29.6
Warrick	392	22,329	21,911	Boonville	2,849	3,934	55.9

STATISTICS FOR THE COUNTIES OF INDIANA AND THEIR COUNTY SEATS—*Continued*

COUNTY	LAND AREA	POPULATION 1900	POPULATION 1909	COUNTY SEAT	POPULATION OF COUNTY SEAT 1900	POPULATION OF COUNTY SEAT 1910	POPULATION OF COUNTY PER SQ. MI. 1910
Washington	519	19,409	17,445	Salem	1,995	2,283	33.6
Wayne	411	38,970	43,757	Richmond	18,226	22,324	106.5
Wells	365	23,449	22,418	Bluffton	4,479	4,987	61.4
White	507	19,138	17,602	Monticello	2,107	2,168	34.7
Whitley	338	17,328	16,892	Columbia City	2,975	3,448	50.0
Totals	36,045	2,516,462	2,700,876		792,985	982,675	Average 74.

APPENDIX B

CITIES AND TOWNS OF 2000 OR MORE POPULATION, CENSUS 1910

CITY OR TOWN	POPULATION IN 1900	POPULATION IN 1910	CITY OR TOWN	POPULATION IN 1900	POPULATION IN 1910
Alexandria	7,221	5,096	Jasonville	—	3,295
Attica	3,005	3,335	Knightstown	1,942	2,008
Aurora	3,645	4,410	Ligonier	2,231	2,173
Batesville	1,384	2,151	Linton	3,071	5,906
Bicknell	—	2,794	Loogootee	1,382	2,154
Bremen	1,671	2,008	Michigan City	14,850	19,027
Cambridge City	1,754	2,237	Mishawaka	5,560	11,886
Clarksville	2,370	2,743	Mitchell	1,772	3,438
Clinton	2,918	6,229	Montpelier	3,405	2,786
Dunkirk	3,187	3,031	Nappanee	2,208	2,260
East Chicago	3,411	19,098	North Vernon	2,823	2,915
Edinburg	1,820	2,040	North Manchester	2,398	2,428
Elkhart	15,184	19,282	Oakland City	1,991	2,370
Elwood	12,950	11,028	Shelburn	523	2,505
Fairmount	3,205	2,506	Tell City	2,680	3,369
Garrett	3,910	4,149	Union City	2,716	3,209
Gary	—	16,802	West Lafayette	2,302	3,867
Gas City	3,622	3,224	West Terre Haute	651	3,083
Hammond	12,376	20,925	Whiting	3,983	6,587
Huntingburg	2,527	2,464			

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